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ABSTRACT

The Intergovernmental Oceanographic Commission was organized by UNESCO to promote scientific investigation with a view to learning about the nature and resources of the oceans and disseminating this knowledge through the concerted action of its members. The report contains a summary of the discussions that took place at the 15th Session of the Commission. This includes the traditional Bruun Memorial Lectures (abstracts of which are included in an appendix). The major portions of this document summarize the discussions that dealt with: (1) administrative arrangements of the session; (2) the recent activities of the commission; (3) ocean studies as they relate to living and non-living resources, ocean mapping, ocean dynamics and climate, and marine pollution and monitoring; (4) ocean services; (5) regional subsidiary bodies; (6) cooperation with other organizations of the United Nations system and with other bodies; (7) medium-term plan, program, and budget; (8) enhancing the role of the commission; and (9) elections of the officers and executive council of the commission. The 13 resolutions adopted by the commission are provided in an appendix, along with the text of four general addresses and a list of officers and participants. (CW)

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Intergovernmental Oceanographic Commission
Reports of Governing and Major Subsidiary Bodies

Fifteenth Session of the Assembly

Paris, 4-19 July 1989

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THE INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
was established within Unesco in November 1960

The functions of the Commission are to:

1. (a) define those problems the solution of which requires international co-operation in the field of scientific investigation of the oceans and review the results of such investigations;

(b) develop, recommend and co-ordinate international programmes for scientific investigation of the oceans and related ocean services which call for concerted action by its members;

(c) develop, recommend and co-ordinate with interested international organizations, international programmes for scientific investigation of the oceans and related ocean services which call for concerted action with interested organizations;

(d) make recommendations to international organizations concerning activities of such organizations which relate to the Commission's programme;

(e) promote and make recommendations for the exchange of oceanographic data and the publication and dissemination of results of scientific investigation of the oceans;

(f) promote and co-ordinate the development and transfer of marine science and its technology, particularly to developing countries;

(g) make recommendations to strengthen education and training in marine science and its technology, and promote relevant projects in these fields as components of each of its programmes;

(h) develop and make recommendations for assistance programmes in marine science and its technology;

(i) make recommendations and provide technical guidance as to the formulation and execution of the marine science programmes of the United Nations Educational, Scientific and Cultural Organization;

(j) promote scientific investigation of the oceans and application of the results thereof for the benefit of all mankind, and assist, on request, Member States wishing to co-operate to these ends. Activities undertaken under this subparagraph shall be subject, in accordance with international law, to the regime for marine scientific research in zones under national jurisdiction;

(k) promote, plan and co-ordinate observing and monitoring systems on the properties and quality of the marine environment, as well as the preparation and dissemination of processed oceanographic data and information, and of assessment studies;

(l) promote, recommend and co-ordinate, with international organizations, as appropriate, the development of standards, reference materials and nomenclature for use in marine science and related ocean services;

(m) undertake, as appropriate, any other action compatible with its purpose and functions concerning the scientific investigation of the ocean and its interfaces.

2. The Commission, in carrying out its functions, shall take into account the special needs and interests of developing countries, including in particular the need to further the capabilities of these countries in marine science and technology.

3. Nothing in this Article shall imply the adoption of a position by the Commission regarding the nature or extent of the jurisdiction of coastal States in general or of any coastal State in particular.

(IOC Statutes, Article 2, amended as November 1987)

In addition to the above, the Commission has a further function which is to act as an effective joint specialized mechanism operating on behalf of certain organizations of the United Nations system substantially concerned with oceanic programmes (United Nations, Unesco, FAO, WMO and IMO), under an agreement developed by the Inter-secretariat Committee on Scientific Programmes Relating to Oceanography (ICSPRO).

Intergovernmental Oceanographic Commission
Reports of Governing and Major Subsidiary Bodies

Fifteenth Session of the Assembly

Paris, 4-19 July 1989

Unesco

In this Series	*Languages*
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1. Eleventh Session of the Working Committee on international Oceanographic Data Exchange	E, F, S, R
2. Seventeenth Session of the Executive Council	E, F, S, R, Ar
3. Fourth Session of the Working Committee for Training, Education and Mutual Assistance	E, F, S, R
4. Fifth Session of the Working Committee for the Global Investigation of Pollution in the Marine Environment	E, F, S, R
5. First Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions	E, F, S
6. Third Session of the *ad hoc* Task Team to Study the Implications, for the Commission, of the UN Convention on the Law of the Sea and the New Ocean Regime	E, F, S, R
7. First Session of the Programme Group on Ocean Processes and Climate	E, F, S, R
8. Eighteenth Session of the Executive Council	E, F, S, R, Ar
9. Thirteenth Session of the Assembly	E, F, S, R, Ar
10. Tenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific	E, F, S, R
11. Nineteenth Session of the Executive Council	E, F, S, R, Ar
12. Sixth Session of the IOC Scientific Committee for the Global Investigation of Pollution in the Marine Environment	E, F, S
13. Twelfth Session of the IOC Working Committee on International Oceanographic Data Exchange	E, F, S, R
14. Second Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions	E, F, S
15. First Session of the IOC Regional Committee for the Central Eastern Atlantic	E, F, S
16. Second Session of the IOC Programme Group on Ocean Processes and Climate	E, F, S
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18. Fourteenth Session of the Assembly	E, F, S, R, Ar
19. Fifth Session of the IOC Regional Committee for the Southern Ocean	E, F, S, R
20. Eleventh Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific	E, F, S, R
21. Second Session of the IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean	E, F
22. Fourth Session of the IOC Regional Committee for the Western Pacific	E only
23. Twenty-first Session of the Executive Council	E, F, S, R
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1. OPENING

1 The Chairman, Professor Ulf Lie, opened the Fifteenth Session of the IOC Assembly at 10.00 on 4 July 1989.

2 **The Assembly took note** with appreciation of the statements given by the Chairman and by Mr. F. Mayor, the Director-General of Unesco, on the occasion of the opening of the Assembly (Annex III - A and B).

3 The Chairman called on the participants to stand in silence for one minute, to mark the death, since the Fourteenth Session, of distinguished individuals who had collaborated with the Commission or had been concerned with marine science. Special reference was made to I. Ronquillo, who served as Chairman from 1982 to 1987 and K. Federov who served as Secretary from 1962 to 1969.

4 **The Assembly also expressed** its appreciation to the Past Secretary, Dr. Mario Ruivo, for his exceptional services to the Commission. A statement of tribute made by the Past Chairman, Dr. A. Ayala-Castañares, is found as Annex III-C.

2. BRUUN MEMORIAL LECTURES

5 **The Assembly noted** that the Bruun Memorial Lectures, to be given on the afternoon of 4 July on the theme of the impact of new technology on marine scientific research, included: (i) submersibles and remotely operated vehicles at the service of oceanologic research, by B. Grandvaux; (ii) the shape of the ocean floor, by Sir Anthony S. Laughton, FRS; (iii) observing change in the global ocean: the view from space, by D. James Baker.

6 Abstracts of the Lectures are given in Annex V. The texts will be published in the IOC Technical Series.

7 Regarding the choice of Bruun Memorial Lectures for the Sixteenth Session of the Assembly, **the Assembly took note** of the theme suggested by the First Vice-Chairman, "Modelling and Prediction in Marine Sciences" with the possibility to include lectures on: (i) Modelling and prediction of El Niño: a phenomenon of global scale; (ii) modelling and prediction of plankton blooms; (iii) modelling and prediction of coastal processes: tools for coastal zone management.

8 **The Assembly** also **took note** of the proposition made by several Delegates to have only two lectures; one in the name of Anton Bruun with a scientific subject in focus, and one, possibly in the name of Marie-Annie Martin-Sané, on marine affairs in an international socio-economic context. **The Assembly** also **noted** that several Delegates emphasized that the number of lectures should not be decreased, and likewise **noted** some specific proposals, such as a lecture reviewing the ecological conditions in the ocean and their prediction and another on coastal zone dynamics. **The Assembly agreed** that this matter should be discussed further by the Executive Council at its Twenty-third Session.

3. ADMINISTRATIVE ARRANGEMENTS

3.1 ADOPTION OF THE AGENDA

9 **The Assembly adopted** the Agenda as given in Annex I.

3.2 DESIGNATION OF THE RAPPORTEUR

10 **The Assembly accepted** the proposal by Canada to designate Dr. V. Arenas (Mexico) as Rapporteur for the session.

3.3 CONDUCT OF THE SESSION, TIMETABLE AND DOCUMENTATION

11 **The Assembly noted** that, pursuant to Rule of Procedure N° 12 (2), the Executive Council, acting as the Steering Committee for the Assembly, had decided that the Nominations Committee for the Fifteenth Session be composed of: Poland, (Chairman), Chile, China, Egypt, Italy, Japan, Senegal, USSR and USA.

12 **The Assembly established** the Resolutions Committee with the following composition: Dr. A. Yankov (Chairman, in his capacity as Second Vice-Chairman of the Commission), Algeria, Argentina, Brazil, China, Costa Rica, France, Germany (Federal Republic of), India, Japan, Kenya, Mexico, Pakistan, Peru, Thailand, USSR, UK (Vice-Chairman) and USA.

13 The Assembly was informed of the decisions taken by the Executive Council with respect to the functions of the Resolutions Committee which was asked to deal with Draft Resolutions in their original language only or, if that was not practical, in an official English translation, before they were submitted for formal translation into the four working languages of the Commission for consideration in Plenary. The Assembly took note of the decision by the Executive Council to adjust the guidelines for the preparation and consideration of draft resolutions (IOC/INF-734).

14 With regard to documentation, **the Assembly noted** some improvement in the availability of the Action Paper and Secretary's Report and **recommended** that efforts continue to circulate all working documents well in advance.

15 **The Assembly also stressed** the desirability of reducing the volume of documentation.

4. REPORT ON ACTIVITIES OF THE COMMISSION

4.1 SECRETARY'S REPORT ON INTERSESSIONAL ACTIVITIES

16 In introducing his Report on Intersessional Activities (Documents IOC-XV/6 and 6 Suppl.), the Secretary reviewed the major trends that have marked IOC programme implementation during 1988 as reflected in the report and also highlighted some developments during the first six months of 1989. His statement is given in Annex III-D.

17 Numerous Delegates took this opportunity to provide information and comment to the Assembly on programmes of particular interest to their countries and regions, especially those such as IOCARIBE, IOCEA, for which there is no item on the Agenda of the present Session.

18 In expressing its appreciation for the work carried out during the reporting period, especially given the reduced number of personnel in the Secretariat, **the Assembly voiced** its deep concern in regard to the continued deterioration of the staffing situation.

19 **The Assembly accepted** the Report of the Secretary on Intersessional Activities and **considered** that information on national activities related to the IOC programmes was an important complementary aspect of such reports.

4.2 ADOPTION OF THE BIENNIAL REPORT FOR 1987-1988

20 The Secretary presented the draft Biennial Report of the Commission which, in accordance with IOC statutes, will be transmitted to the 25th Unesco General Conference. He reminded Delegates of the limited number of pages allocated for this report which, in consequence, could only provide a brief overview of the many activities undertaken by the Commission during 1987-88.

21 Noting that such reports in the past had served not only to inform the General Conference, but also as public information material, **the Assembly agreed** that the Secretary should try to arrange for the issuance of a brochure on IOC programmes and activities, using the services of appropriate outside specialists.

22 **The Assembly requested** the Director-General of Unesco to consider a small increase in the number of pages allocated to the Biennial Report in order to accommodate the need to provide more detailed information on regional activities and scientific conferences, seminars, etc., organized by IOC during the two-year period.

23 Having requested the Secretary to take into account a few additions, **the Assembly adopted** the Biennial Report for 1987-1988 for transmission to the General Conference.

5. OCEAN SCIENCES

5.1 OCEAN DYNAMICS AND CLIMATE (ODC)

24 Under this item, **the Assembly considered**: progress in the planning and implementation of Tropical Oceans and Global Atmosphere (TOGA) and World Ocean Circulation Experiment (WOCE); the development of ocean observing systems; and relevant activities and recommendations of the IOC Technical Committee on Ocean Processes and Climate (TC/OPC) and the Joint SCOR-IOC Committee on Climatic Changes and the Ocean.

25 **The Assembly noted** the importance, in particular for developing countries, of distributing the reports and recommendations of various meetings dealing with the ocean and climate programmes of IOC in the official languages of the Commission. It was noted, however, that in view of the substantial financial implications for such work, assistance of Member States should be sought for translation of those documents.

5.1.1 OCEAN PROCESSES AND CLIMATE

26 The Chairman of the TC/OPC, Professor K. Voigt, presented the Executive Summary and Recommendations of the Third Session of the Technical Committee (Paris, 27-29 June 1989; Document IOC/TC-OPC-III/3S).

27 In accordance with its terms of reference and the instructions of the Twenty-first Session of the IOC Executive Council (Paris, 7-15 March 1988), the Technical Committee reviewed progress in the implementation of TOGA and the planning of WOCE and in the development of ocean observing systems. The Committee considered and made recommendations to the Assembly on institutional arrangements for WOCE; on the outcome of the Second Session of the WMO-IOC Intergovernmental TOGA Board; and on the development of global integrated ocean observing systems, including future involvement of IOC in satellite observing systems, and possible support to the future operation of the North Atlantic Ocean Weather Stations by the oceanographic community. The Committee also considered the report and recommendations of the First Session of the IOC Group of Experts on the Global Sea-Level Observing System (GLOSS), held from 19 to 23 June 1989 at Bidston, UK. This programme and relevant recommendations of the Technical Committee was discussed under item 6.2.1. The Committee likewise considered the proposal of the ad hoc Expert Consultation on the Establishment of an IOC Programme for

Dynamics and Oceanography of Coastal and Shelf Seas and Exchanges (Doc. IOC/INF-769 and Corr.). Noting with concern the possible termination of the North Atlantic Ocean Weather Stations at the end of 1989, the Committee recommended that Member States be invited to consider ways and means to continue the long-term ocean measurements that have been collected from Ocean Weather Ships. The Committee also recommended that IOC activities in the application of satellite remote-sensed data for the study of the marine environment be strengthened.

28 Professor Voigt emphasized that discussions held at the Third Session of the Committee demonstrated the need to strengthen considerably the role of IOC, and the oceanographic community, in the deliberations and global programmes related to climate and global change problems. In this connection the IOC should play an active role in preparations for the Second World Climate Conference, to be held in Geneva in November 1990.

29 Professor Voigt announced the results of TC/OPC elections, whereby Dr. D. James Baker (USA) was elected Chairman and Dr. Mario Ruivo (Portugal) was elected Vice-Chairman.

30 **The Assembly noted** the need to continue close collaboration between the TC/OPC and relevant bodies of WMO; the SCOR-IOC CCCO; the WMO-ICSU JSC; and the IOC subsidiary bodies concerned (IGOSS, IODE, GLOSS, DBCP); and the need for its involvement in the planning and implementation of the World Climate Research Programme (WCRP) and global ocean observing systems.

31 **The Assembly endorsed** the Summary Report of the Technical Committee on Ocean Processes and Climate, together with its recommendations, and **expressed** its thanks to Professor Voigt for his contribution to the successful activities of the Technical Committee.

32 **The Assembly emphasized** the need to strengthen the role of IOC, and the Technical Committee on Ocean Processes and Climate in particular, in intergovernmental co-ordination of the oceanographic programmes of the WCRP; in developing global ocean observing systems; and in the co-ordination in this context of the activities of relevant IOC subsidiary bodies.

5.1.2 OCEANOGRAPHIC COMPONENTS OF THE WCRP

33 The Chairman of the SCOR-IOC Committee on Climate Changes and the Ocean (CCCO), Dr. Angus McEwan, introduced the item. Referring to the Tenth Session of the CCCO (Halifax, Canada, 14-20 June 1989), he informed the Assembly on the progress in TOGA and WOCE, which together constitute the major experimental components of the WCRP. Development of both programmes was characterized as impressive, with a high level of demonstrated co-operation and commitment by the participating scientists, institutions and organizations.

34 The expansion and proliferation of international climate research initiatives external to the WCRP, and the need to ensure a strong and coordinated oceanographic component, was noted as a significant development since the last Assembly. The CCCO recognized its responsibility to provide an essential bridge between the intergovernmental and nongovernmental organizations. Connections with the SCOR-sponsored Joint Global Ocean Flux Study (JGOFS) have been established through a joint JGOFS-CCCO Carbon Dioxide Panel. Linkages with the ICSU International Geosphere-Biosphere Programme (IGBP): A Study of Global Change are being strengthened through the WMO-ICSU Joint Scientific Committee (JSC) of the WCRP. The strengthening of relationships with the JSC has been reflected in the proposed joint sponsorship of several subsidiary bodies, including the new JSC-CCCO Sea Ice and Ocean Observing System Development Groups and by the participation of CCCO and JSC officers at each of their respective annual sessions.

35 Serious concern was expressed by the CCCO Chairman regarding the scientific basis for some reports on climate change impact, issued by some scientists and reported upon by the press, particularly with regard to sea level rise. The possible influence on public opinion and resulting governmental policies could have serious economic and social impact. It was stressed that CCCO would take an active role in projecting rational and scientifically based reaction to both the role of the ocean in climate change and the impact on the ocean of climate change.

36 **The Assembly noted** that TOGA and WOCE are the main contributors among IOC programmes to the international debate on climate change, and that the Commission has an essential contribution to make in ensuring an ocean perspective and the provision of sound scientific advice to the international initiatives and actions dealing with climate change. The WMO-UNEP Intergovernmental Panel on Climate Change (IPCC) and the Second World Climate Conference were noted as particular examples.

5.1.2.1 Study of the Tropical Ocean and Global Atmosphere (TOGA)

37 With regard to TOGA, designed to determine the predictability of interannual variations in global climate, including those associated with the El Niño-Southern Oscillation (ENSO) phenomenon, the CCCO Chairman highlighted substantial advances. Included were:

(i) expansion of the monitoring program, including new XBT Sections in the Indian Ocean, an expanded sea-level network in the Pacific and Indian Oceans, and the growing efficiency of operational data centres;
(ii) process studies completed or underway to understand the dynamics of the Equatorial Pacific Ocean and its interaction with the atmosphere;
(iii) the development of coupled general circulation models of the ocean-atmosphere system in several centres, and studies of sensitivity to surface forcing and surface flux estimation;
(iv) the establishment of the first 'operational' ocean model (at the US NOAA/National Meteorological Center) for seasonal climate prediction; and
(v) the use by some countries of TOGA data in empirical schemes for strategic interseasonal climate forecasting.

38 A proposal for a major study of ocean-atmosphere interaction processes in the West Equatorial Pacific was developed by the TOGA-SSG. The TOGA Coupled Ocean Atmosphere Response Experiment (TOGA-COARE) was reviewed and endorsed by CCCO at its Tenth Session as an augmentation to the International TOGA programme. A presentation on this will be made at the next session of the IOC Executive Council. This experiment is seen to be important in leading to the better parameterization of heat and water flux between the ocean and atmosphere for both short and long-term climate prediction models. As a focus for Indian Ocean studies, a Monsoon Numerical Experimentation Group (MONEG) has been formed by the TOGA-SSG to address the important question of Indian monsoon variability.

39 Research in the Atlantic Ocean remains relatively unrelated to TOGA objectives due to the broader spectrum of variability and possible strength of extratropical influences. Encouragement is given to the planned IGOSS Sea-Level Pilot Project (ISLPPNTA) to improve and expand sea-level monitoring in this ocean.

40 At the middle of TOGA's field phase in 1990, an International Scientific Conference will be held in Hawaii to review scientific achievements, assess the prospects for attaining the scientific objectives of TOGA by 1995, and consider the future scientific programme of TOGA.

41 The Chairman of the TC/OPC, Professor K. Voigt presented the Executive Summary Report and recommendations of the Third Session of the IOC TC/OPC (Paris, 27-29 June 1989) regarding TOGA, including proposals forwarded by the Second Session of the WMO-IOC Intergovernmental TOGA Board, (Geneva, 5-9 December 1988).

42 **The Assembly expressed** its satisfaction with the progress of the TOGA programme.

43 Many Delegates informed the Assembly on the participation of their countries in the TOGA Programme. In particular, the importance of TOGA was noted in the development of predictive models of monsoon variability in the Indian Ocean area.

44 **The Assembly requested** the Secretary IOC to assist with and provide support for the participation of oceanographers from developing countries in the International TOGA Scientific Conference.

45 **The Assembly adopted** Resolution XV-1.

5.1.2.2 **World Ocean Circulation Experiment (WOCE)**

46 A major event in the development of WOCE was the endorsement of its Implementation Plan by the IOC-WMO-ICSU-SCOR International WOCE Scientific Conference held at Unesco Headquarters (Paris, 28 November - 2 December 1988). The Implementation Plan for WOCE was used as a framework for statements of intentions to support and participate in WOCE. The Conference found sufficient potentially available resources in the plans presented, to justify commencement of field studies in 1990 on CORE Project 1 (the Global Description) and CORE Project 2 (the Southern Ocean). Some critical gaps remain in measurements for air-sea flux estimation and repeat hydrography, particularly for CORE Project 3 (the Gyre Dynamics Experiment, in the Atlantic Ocean). The field phase of WOCE will provide a comprehensive and near-contemporaneous data-set over the whole global ocean, together with selected studies of ocean processes.

47 WOCE was designed and scheduled to exploit the opportunity for ocean observation provided by the experimental satellite radar altimeter and scatterometer missions of TOPEX-POSEIDON, ERS-1 and NSCAT. The delays in satellite launching, the possible hiatus that may occur following the present generation of experimental satellites, and policy issues on access and charging for data also raise serious concerns in relation to the long-term observational strategy for the ocean.

48 **The Assembly expressed** deep concern at the delays and postponements in the launching of these and other missions crucial to WOCE and to ocean-climate programmes.

49 A critically important goal of WOCE is to determine the representativeness of the specific WOCE data sets for the long-term behavior of the ocean. Development of a scientific strategy for the long-term monitoring of the ocean, particularly of those parameters that are indices of climate changes on decadal time scales, is required. The development of an intergovernmental strategy for a global integrated ocean observing system for climate monitoring likewise is crucial. This matter was discussed under item 5.1.4.

50 The proposed organizational arrangements for WOCE have been the subject of exhaustive consideration by the Chairman IOC and President SCOR, with the participation of the Chairmen of TC/OPC, CCCO and the WOCE-SSG. The proposal of the Chairman IOC and the President SCOR was endorsed by the Third Session of the TC/OPC. In commending the formation of the Intergovernmental WOCE Panel to the Assembly, the Chairman CCCO stressed the effective use made of existing intergovernmental bodies and mechanisms, and the need to ensure the greatest opportunity for international participation in whatever form it can be provided. He also noted the importance of maintaining a high scientific quality in the implementation of WOCE.

51 The Chairman of the TC/OPC, Professor K. Voigt, presented the Executive Summary Report and recommendations of the Third Session of the IOC TC/OPC (Paris, 27-29 June 1989) regarding WOCE.

52 **The Assembly recognized** that the Intergovernmental WOCE Panel would serve to identify WOCE priorities requiring governmental support, to address means of providing resources required by WOCE, and to provide a means by which developing countries could be actively associated with WOCE.

53 Many Delegates recognized the need to mobilize active participation of coastal countries in WOCE. It was noted that observations are needed both inside and outside of Exclusive Economic Zones (EEZs), and that this will require wide international co-operation through bilateral, multilateral and possibly other arrangements between coastal research countries.

54 **The Assembly expressed** its satisfaction with the notable progress made in the planning of WOCE and **emphasized** the importance of WOCE to all Member States.

55 **The Assembly adopted Resolution XV-2.**

5.1.3 OCEAN DYNAMICS AND CIRCULATION ON THE CONTINENTAL SHELF

56 Professor A. Robinson, Chairman of an ad hoc expert consultation on Ocean Dynamics and Circulation on the Continental Shelf (Paris, 4-7 January 1989), presented the proposal on "An International Programme for the Dynamics and Oceanography of Coastal and Shelf Seas and Exchanges : Rationale and Elements" prepared by the ad hoc expert consultation (Document IOC/INF-769). A corrigendum to the document and relevant proposals and recommendations made by IOC subsidiary bodies were also reviewed (Document IOC-XV/Annex 8 Add.1).

57 The rationale for this proposal is that the circulation and the associated dynamic processes and forcing, and the exchanges between the open sea and shelf, are fundamental for the proper understanding of the conditions in the transition zone from the land to the open seas. This is also the zone where human activities and influences are concentrated.

58 To further develop this programme, four phases were proposed by the ad hoc consultation to be implemented during at least a ten-year period, with development of appropriate human and infrastructural resources as a foremost element. Before the international programme is launched, a workshop is proposed to be held in 1990 or 1991 for assessing the state-of-the-art and the need for transfer of technology. The workshop should have representation from developing and developed countries and a comprehensive participation from all interested member states should be encouraged.

59 A large number of Delegates supported the proposed programme and informed the Assembly of relevant national activities in the field, considering such a programme to be very important, from both a scientific and socio-economic point of view.

60 Many Delegates emphasized the need for co-ordination and collaboration with on-going global and regional programmes and organizations, inside and outside the UN system. Especially, the mechanism available through the IOC Regional Subsidiary Bodies ought to be used for both programme formulation and implementation. The need to ensure that proper interdisciplinary aspects be taken into account in due course was also emphasized by some Delegates.

61 Some Delegates, noting the importance of ensuring the widest possible involvement of the scientific community in the development of this programme, requested the Secretary to undertake consultation with the Scientific Advisory Bodies of the Commission, in particular SCOR.

62 Several Delegates expressed the view that legal aspects in the field work should be taken into account.

62 bis **The Assembly adopted** Resolution XV-3.

5.1.4 FUTURE REQUIREMENTS FOR AN INTEGRATED GLOBAL OCEAN MONITORING SYSTEM AS A BASIS FOR A WORLD OCEAN WATCH

63 The Chairman of the Technical Committee on Ocean Processes and Climate, Professor K. Voigt, presented the proposal and Recommendation TC-OPC-III.3, in which the IOC Assembly was invited to confirm the urgent need to design and implement a global integrated ocean observing system, and to initiate work accordingly. The Committee suggested the name 'Global Integrated Ocean Observing System' be used. This ocean observing system should be a part of a global system for monitoring and predicting environmental change. It should be obtained through an accelerated deployment of existing observing systems and through a progressive integration of new technology, both in situ and satellite-borne, with existing systems that can lead to a world ocean watch in analogy with a World Weather Watch. Recommendation TC-OPC-III.3 contains specific proposals regarding the strengthening of IOC's role in this field and the criteria and approach for the development of such a system. In preparing this recommendation, the Committee took into consideration proposals made by the ad hoc Expert Consultation on Ocean Observing Systems Development (Paris, 20-22 March 1989; Document IOC/INF-777), and the decision of the Forty-first Session of the WMO Executive Council (its Resolution No. 11).

64 The Representative of WMO informed the Assembly, that the recent Forty-first Session of the WMO Executive Council, in its discussion of climate issues generally, had clearly recognized the role of the ocean in global climate processes, and, in particular, had placed great importance on the development and implementation of a global operational ocean observing system in support of climate monitoring, research and prediction. It had adopted a resolution on this subject, and in doing so had emphasized the need for close co-operation between WMO and IOC in the development and implementation of the system, in view of the complementary interest and roles of the two Organizations in the marine environment, and the need to make the most effective use of available resources.

65 **The Assembly emphasized** the need for close co-ordination between TC/OPC and the SCOR-IOC Committee on Climate Changes and the Ocean in formulating scientific requirements for the proposed global integrated ocean observing system and noted the SCOR-IOC CCCO and JSC for WCRP plan to establish an Ocean Observing System Development Panel (OOSDP). **The Assembly supported** the TC/OPC proposal to establish an IOC ad hoc Group of Experts to work with and support the CCCO-JSC OOSDP to develop a plan for a global integrated ocean observing system, as a subsidiary body of the Technical Committee on Ocean Processes and Climate. **The Assembly also noted** that the results of the work on the ocean observing systems could make a valuable contribution to international climate initiatives, such as the Second World Climate Conference.

66 Some Delegates noted that in preparing a detailed plan for a global integrated ocean observing system, the WCRP Global Energy Water Cycle Experiment (GEWEX) [Ref.: WCRP-5 concept of the Global Energy and Water Cycle Experiment - WMO/TD - No.215] should be considered.

67 Some Delegates pointed out the need to use existing mechanisms and subsidiary bodies of IOC and WMO in implementing the proposed global system.

68 **The Assembly noted** with appreciation the decision of the Forty-first Session of the WMO Executive Council on the development of a global operational ocean observing system needed for climate monitoring, research and prediction and agreed that close co-ordination with relevant WMO bodies is required in order to ensure compatibility of the ocean and atmosphere observing systems and to ensure rational use of national resources needed to develop global integrated ocean observing systems.

69 **The Assembly noted** the creation and the activities of the WMO-UNEP Intergovernmental Panel on Climate Change, the preparations for the Second World Climate Conference to be held in November 1990, and expected consideration by the UN General Assembly of a Convention on Global Change. **The Assembly emphasized** the need for an active and strengthened involvement of IOC in these activities and **requested** the Chairman of IOC and Secretary IOC to take appropriate steps accordingly and to ensure the recognition of the need for ocean monitoring as an integral part of the global environment studies. **The Assembly noted** the growing concern of the public and governments with respect to the problems of global change and **emphasized** that the dominating role of the ocean in global change must be made clear to decision makers, and **stressed** the responsibility of IOC in this process. Some Delegates noted that the global integrated ocean observing system could lead toward a World Ocean Watch analogous to the World Weather Watch.

70 Many Delegates noted that the creation of such a global integrated ocean observing system will need substantial new commitments from governments, and that it is precisely the recognition of the role of the ocean in global change, and the associated need for ocean data in predicting changes in the global environment, that provides the justification for developing and securing such commitments. Clearly the data provided by the global system will also be of great importance to scientific and operational applications at regional, sub-regional and national levels.

71 **The Assembly also recognized and emphasized** that, in order to develop a truly global integrated ocean observing system, special attention should be given to providing assistance to developing countries, on a bilateral and multilateral basis as well as through IOC, so as to enhance their capabilities for active participation in the system. This will involve extensive training programmes and provision of equipment and instruments. **The Assembly expressed concern** that the funds available under IOC/TEMA for ocean observing systems are insufficient to provide the necessary support. Taking into account the importance of the ocean observing system to global and regional applications, **the Assembly urged** the Secretary to seek additional funds for IOC/TEMA activities.

72 Many Delegates also noted that a global integrated ocean observing system could be most efficiently implemented through intensification of regional co-operation where there are common scientific and practical interests for groups of countries.

73 The Assembly adopted Resolution XV-4.

5.2 OCEAN SCIENCE IN RELATION TO NON-LIVING RESOURCES (OSNLR)

5.2.1 IOC-UN GUIDING GROUP OF EXPERTS ON OSNLR

74 The Chairman of the IOC-UN(OALOS) Guiding Group of Experts on Ocean Science in Relation to Non-Living Resources (OSNLR), Professor Michel Vigneaux, introduced this Agenda Item, referring to the Summary Report of the Third Session of the Guiding Group of Experts on OSNLR (Bordeaux, France, 21-25 February 1989).

75 At the regional level, following Resolution XIV-11, an OSNLR group was created for the IOCEA region and met in Abidjan, Côte d'Ivoire, 2-5 November 1988. The group formulated a plan for regional co-operative studies on sedimentary dynamics and coastal erosion. The Comission Permanente del Pacifico Sur (CPPS) has recently proposed (Quito, Ecuador, 14-16 June, 1989) the creation of a joint CPPS-IOC Group of Experts for the development of OSNLR related activities in the eastern Pacific region. A similar proposal has been received from the International Commission for Scientific Exploration of Mediterranean (ICSEM) for non-living resources studies in the Mediterranean. It is proposed that IOC co-sponsors an ICSEM-IOC workshop on this subject in conjunction with the ICSEM General Assembly in October 1990.

76 IOC, through OSNLR, contributed to the formulation of a Past Global Change Programme as a possible co-operative programme with Unesco and IUGS (CMG) of ICSU, as a contribution to the International Geosphere-Biosphere Programme (IGBP), a Study in Global Change, possibly using the IGCP as a model.

77 The Chairman of the Guiding Group of Experts on OSNLR summarized the near-term workplan proposed by the Guiding Group of Experts, including : (i) a preparation of late quaternary palaeo-oceanographic maps in the WESTPAC region; (ii) study of boundary processes along the margins of active plates and related training activities; (iii) study of the sediment budget of the nearshore area in the IOCEA region; and (iv) a global scale study of stratabound authigenic/diagenic sediments on the composition and spatial distribution of phosphorite concretions in the continental margin.

78 Some Delegates took this opportunity to inform the Assembly on their relevant national programmes. Several Delegates expressed their appreciation of the efforts made by the Guiding Group to promote and provide technical guidance to research projects on a regional basis, particularly in the eastern Atlantic where Member States are facing serious coastal zone problems such as the control of erosion. It was pointed out that effective use of existing national resources, particularly research capabilities and research vessels, should be encouraged to ensure active implementation of such regional projects. The parallel need to develop extrabudgetary projects and training activities was recognized as an important element to encourage participation of developing Member States in proposed regional projects.

79 **The Assembly expressed** its appreciation to Nigeria for the offer to provide ship time to help fulfil the research vessel requirements for the regional co-operative studies on sedimentary dynamics and coastal erosion in parts of the IOCEA region.

80 **The Assembly took note** of the proposal by the Ukrainian SSR to organize in Kiev in 1991 training courses in marine geology for developing countries and **agreed** on IOC involvement and support in the planning and organization of these courses.

81 **The Assembly instructed** the Secretary to continue and strengthen co-operation with existing scientific programmes such as the International Geological Correlation Programme (IGCP) and the Ocean Drilling Programme (ODP), with International Union of Geological Sciences (IUGS) projects on the Circum Pacific Map and Circum Atlantic Map, and with the ICSU International Geosphere-Biosphere Programme (IGBP): A Study in Global Change, as well as with international organizations including CPPS, ICSEM, CCOP, CCOP(SOPAC), especially with regard to joint regional scientific projects.

82 **The Assembly agreed** that IOC should, in accordance with well established relations in the past, hold jointly with IUGS(CMG), ICSU and Unesco, the Fourth International Workshop on Marine Geosciences in 1990.

83 **The Assembly welcomed** the comprehensive report presented by the Chairman of the Guiding Group and **endorsed** the Summary Report of the Third Session (Document IOC-UN(OALOS)/OSNLR-III/3) together with its recommendations.

5.2.2 CCOP-IOC STUDIES OF EAST ASIAN TECTONICS AND RESOURCES (SEATAR)

84 Referring to the Summary Report of the Fourteenth Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies of East Asian Tectonics and Resources (Bagio City, Philippines, 8-11 December 1988, Document CCOP-IOC/SEATAR-XIV/3), the IOC Assistant Secretary, Dr. K. Kitazawa, introduced the item.

85 The Working Group had reviewed the situation as regards the preparation of the final report of the transect studies, the analysis of the geological and geophysical data, and subsequent presentation of the transects carried out by the geological surveys of participating Member States. An overall co-ordinator to finalize the manuscript was appointed by the CCOP Technical Secretariat in June 1989. These

transect maps, when published, will represent one of the most comprehensive and detailed regional marine geological/geophysical studies undertaken within the UN system.

86 **The Assembly endorsed** the Summary Report of the Working Group's Fourteenth Session **and expressed** satisfaction with progress made in transect studies.

87 In recognizing the usefulness of such transect studies, **the Assembly urged** the Secretary IOC to make all possible efforts, together with the CCOP Technical Secretariat and ESCAP, to obtain necessary funds for publication, on an individual basis, of the transect maps.

88 **The Assembly agreed** to hold a joint workshop with CCOP in 1990 to identify future joint projects to follow the transect studies.

89 **The Assembly welcomed** information on plans for an IOC Advanced Training Course on Continental Shelf Structure, Sediments and Resources to be held in Manila, Philippines, 1-15 October 1989 **and expressed** its appreciation to the Government of the Federal Republic of Germany for technical and financial assistance and to the Government of the Philippines for hosting the course.

5.2.3 CCOP(SOPAC)-IOC STUDIES OF SOUTH PACIFIC TECTONICS AND RESOURCES (STAR)

90 The IOC Assistant Secretary, Dr. K. Kitazawa, provided a brief review of the Summary Report of the Fourth Session of the Joint CCOP(SOPAC)-IOC Working Group on South Pacific Tectonics and Resources (STAR) (Suva, Fiji, 14-15 October 1988; Document CCOP-IOC/STAR-IV/3). Following recommendations made at the joint CCOP(SOPAC)-IOC Workshop on Coastal Processes in the South Pacific Island Nations (Lae, Papua New Guinea, 1-8 October 1987), the Coastal and Nearshore Processes Study Group is now drafting a detailed workplan for implementation. IOC, through an expert in the region, is involved in this exercise. The Remote Sensing Study Group completed an analytical study of the coastal area of the Cook Islands, using SPOT imagery. Considering the importance of this study, the Working Group wishes to develop a regional project on application of satellite imagery to coastal resources inventory mapping. A CCOP(SOPAC)-IOC International Workshop on Marine Geology, Geophysics and Mineral Resources in the South Pacific is being planned in conjunction with the Eighteenth Annual Session of the CCOP(SOPAC) (Canberra, Australia, September 1989). The main objective is to review the progress of marine geology/geophysics studies in the South Pacific and to identify common topics for future international co-operative research.

91 **The Assembly accepted** the Summary Report together with recommendations **and instructed** the Secretary IOC to develop further the close co-operation with CCOP(SOPAC) in activities related to OSNLR.

92 **The Assembly recognized** that efforts should be made to avoid duplication of activities between STAR, SEATAR and WESTPAC **and asked** the Secretary IOC to study this matter further.

93 **The Assembly agreed** to co-sponsor the Workshop on Marine Geology, Geophysics and Mineral Resources in the South Pacific (September 1989).

5.3 OCEAN MAPPING

94 The Chairman of the IOC Consultative Group on Ocean Mapping (CGOM), Mr. Desmond P.D. Scott, introduced the report of the Consultative Group on Ocean Mapping (Document IOC/INF-770) and the Summary Report of the Third Session of the IOC Consultative Group on Ocean Mapping, Bremerhaven, 7-9 December 1988 (Document IOC/CGOM-III/3), which together summarized information on activities of all IOC Ocean Mapping bodies, during the intersessional period.

95 He recalled that there are three main, closely linked activities in the IOC Ocean Mapping programmes: the Joint IOC-IHO General Bathymetric Chart of the Oceans (GEBCO); the regional ocean mapping projects; and the International Geological/Geophysical Atlases of the Atlantic and Pacific Oceans (GAPA). All three activities are developing satisfactorily.

96 In moving forward towards publication of a new edition of GEBCO scheduled for publication in 1995, the Guiding Committee has carried out a detailed study of user requirements and how to meet them in the light of new technologies, within a new structure for global and regional ocean mapping activities.

97 Following a recommendation of the GEBCO Guiding Committee, and in order to ensure that sounding data in digital form enter the world data centre system, an IHO Centre for Digital Bathymetry will be established, after consultation with IHO Member States, on behalf of IHO by the US National Geophysical Data Center at Boulder, Colorado.

98 The International Bathymetric Chart of the Mediterranean (IBCM), co-sponsored with the International Commission for the Scientific Exploration of the Mediterranean Sea (ICSEM), is now in its second phase, during which five Geological/Geophysical series on the same scale as the bathymetric chart will be produced.

99 Other regional mapping projects are underway, with publication of the first ten sheets for the Caribbean Sea and the Gulf of Mexico (IBCCA) scheduled in 1991. The Editorial Board for the International Bathymetric Chart of the Western Indian Ocean (IBCWIO) has now been established, and its first session was held in Antananarivo, Madagascar, in April 1989. It has not yet been possible to start work on the International Bathymetric Chart of the Central Eastern Atlantic (IBCEA), but it is intended to convene the first session of the Editorial Board later in 1989, subject to completion of negotiations with Member States concerned.

100 The International Geological/Geophysical Atlas of the Atlantic Ocean is virtually complete and will be published later in 1989. Many of the maps had already been printed and some were on display with a brochure containing a detailed contents list and a form for advance orders.

101 A large amount of work has already been carried out on the compilation of maps for the Pacific Atlas. To stimulate input and interest in this atlas, the next meeting of the Central Editorial Board for GAPA will be held in conjunction with an international symposium on Geological/Geophysical Mapping of the Pacific Ocean (September 1989; Yuzhno - Sakhalinsk, USSR), being sponsored by the Far East Branch of the USSR Academy of Sciences.

102 Numerous Delegates expressed their satisfaction with the work on the IOC Ocean Mapping Programme and pledged support to the on-going and planned activities of the Commission in this field.

103 **The Assembly endorsed** the Report of the Third Session of the Consultative Group on Ocean Mapping and its recommendations (IOC/CGOM-III/3).

104 **The Assembly decided** that a meeting of experts should be arranged during the next WESTPAC session to discuss the possibility of compiling a bathymetric chart for the WESTPAC area, and **welcomed** the generous offer of China to assist in the preparation and publication of such a chart.

105 **The Assembly noted** that the International Hydrographic Organization (IHO) much appreciated its close involvement with various Ocean Mapping activities of the Commission and looked forward to strengthening further these links.

106 **The Assembly agreed** to invite IHO to nominate a full member for:

(i) the IOC Consultative Group on Ocean Mapping (CGOM)
(ii) each of the IOC Editorial Boards for regional international bathymetric charts.

107 **The Assembly recommended** that the Secretary IOC approach the Secretary-General ICSEM with an invitation to nominate a full member to the IBCM Editorial Board.

108 **The Assembly expressed** its sincere appreciation to the Government of the USSR for its support to IOC's Ocean Mapping activities by funding the preparation of the GAPA Atlases and the IBCM Geological/Geophysical Series and also for its active role in the digitization of the IBCM and certain GEBCO sheets, and for the secondment of a senior staff member to the Secretariat.

109 **The Assembly thanked** the Governments of France and United Kingdom for their considerable efforts in the preparation of the 'GEBCO Digital Atlas', and **expressed** its great appreciation to the Government of Monaco for the facilities made available for the IBCM Secretary and the joint Operational Unit for the Mediterranean.

110 **The Assembly acknowledged** with thanks the offer of Venezuela to host the Third Session of the Editorial Board for IBCCA.

5.4 MARINE POLLUTION RESEARCH AND MONITORING AND RELATED PROGRAMMES

5.4.1 GLOBAL INVESTIGATION OF POLLUTION IN THE MARINE ENVIRONMENT (GIPME) AND THE MARINE POLLUTION MONITORING SYSTEM (MARPOLMON)

110 bis The Chairman of the IOC Scientific Committee for the Global Investigation of Pollution in the Marine Environment (GIPME), Dr Neil Andersen, introduced this Agenda Item, referring to the Secretary's Report (Document IOC-XV/6), to the Proposals on Further Development of Regional Components of GIPME/MARPOLMON and Co-operation with UNEP (Document IOC-XV/8 Annex 1) and the International Musselwatch Programme (Document IOC-XV/Inf.2).

111 Dr. Andersen informed the Assembly of the considerable intersessional progress in the GIPME Programme and of the numerous accomplishments in the work of its Groups of Experts on Methods, Standards and Intercalibration (GEMSI), on Effects of Pollutants (GEEP) and on Standards and Reference Materials (GESREM).

112 Satisfactory progress is being made in developing a joint IOC-UNEP proposal to implement an International Musselwatch Programme, in co-operation with UNEP, with the Americas possibly constituting its first phase. He pointed out that the GIPME Programme and the MARPOLMON System are also implemented on a regional basis by dealing with regional priority problems. As a good example of regional activities, he referred to the regional pilot project on monitoring marine petroleum pollution in the Western Indian Ocean which is being initiated under GIPME. In addition, he noted that an initiative with ILMR, within the Memorandum of Understanding between IAEA and IOC will be undertaken, with regard to training and the provision, and maintenance of instrumentation and equipment.

113 He pointed out GIPME's strong role with regard to TEMA activities, resulting in the training of 112 individuals in six regions. In addition, about two hundred students have had the benefit of instruction by IOC-sponsored lecturers at the World Maritime University, through a special course module developed by IOC in co-operation with IMO.

114 He presented the proposal for furthering IOC and UNEP co-operation by a joint sponsorship of GIPME. The background, rationale and the specific mechanism for this is described in Document IOC-XV/8 Annex 1.

115 Finally, he highlighted a proposal to convene in 1991 a symposium on global ocean monitoring of environmental parameters, other than those related to climate change issues, the results of which could serve as a contribution to the Second World Environment Conference in 1992, which will mark 20 years since the Stockholm Conference.

116 **The Assembly gave** strong support to the GIPME Programme as a whole, which was considered to be a very successful initiative. In particular, both IOC and UNEP were praised for their ever-increasing level of co-ordination and co-operation. Concern was expressed, however, at the length of time that has elapsed since the last meeting of the Scientific Committee for GIPME.

117 Some Delegations supported the proposal to organize an International Symposium on Integrated Global Ocean Monitoring. The Delegate of the USSR, in offering to host the symposium, also pointed out the complexity of the marine pollution processes, requiring inter-disciplinary studies including bio-geochemistry and toxicology, and proposed a joint meeting of GEEP and GEMSI in the USSR in 1990.

118 Several Delegates described a number of marine pollution problems in their regions which, in some cases, are affecting living resources. The Delegate of Bulgaria made specific reference to the planning taking place in the Black Sea region, with the idea of developing a regional project, possibly in co-operation with UNEP, IOC and others, that would have a bearing on the health of the Black Sea. In addition, the Delegate proposed to host a Science and Technology Conference on the Black Sea, under the auspices of IOC and possibly other organizations, in the fall of 1991.

119 The representative of CPPS expressed appreciation for the support given by IOC to the on-going activities related to marine pollution in the South East Pacific, especially in matters related to several courses and to the "Seminar on Research and Monitoring in Marine Pollution in the South East Pacific" which will take place in Cali, Colombia, September 1989, also with the support of UNEP and IAEA.

120 The proposed joint sponsorship of the GIPME Programme by IOC and UNEP was strongly supported by all the Delegates. The draft terms of reference presented in Document IOC-XV/8 Annex 1 were noted. It was also noted that the Scientific Committee for GIPME has an open-ended membership and is not proposed to be disbanded. The need to keep the GIPME Groups of Experts purely scientific was emphasized by several Delegates. One Delegate suggested that the proposed IOC-UNEP Intergovernmental Panel could serve as a policy and assessment advisory body with the Scientific Committee remaining the scientific intergovernmental group.

121 It was stressed that the terms of reference for the proposed Panel had to be clearly spelled out. Several Delegates expressed the opinion that the proposed Joint IOC-UNEP Intergovernmental Panel for GIPME should be open for membership to all IOC Member States. The Secretariats of IOC and UNEP would endeavour to agree on the details regarding all aspects so as to ensure that the best interests of both Organizations are catered to.

122 **The Assembly considered** that the complex subject of marine pollution needed to be addressed bearing in mind, inter alia, (i) ecological studies, including further strengthening of the IOC-MAB co-operation on marine biosphere reserves; (ii) global ocean monitoring of contaminants (other than those associated with global change issues).

123 **The Assembly endorsed** the proposal to convene, jointly with other appropriate international organizations, the Second International Symposium on Integrated Global Ocean Monitoring in 1991 and **thanked** the USSR for its offer to host it. **The Assembly also concurred** with the proposal of the USSR to organize a joint meeting of GEEP and GEMSI in the USSR in 1990.

124 The Representative of UNEP noted that UNEP intends to co-sponsor GIPME, and that the details for such co-sponsorship could be worked out. He stressed the importance of the endorsement by the Assembly on the principle of co-sponsorship. He pointed out, however, his concern over the present shortage of staff, in particular for the GIPME Programme, in the IOC Secretariat as also noted by the Chairman of GIPME in his introductory remarks. The Representative of UNEP recalled UNEP's support to the development of the International Musselwatch Programme.

125 **The Assembly noted** with appreciation the hosting by China of the GIPME-GEMSI Workshop on the Use of Sediments in Marine Pollution Research and Monitoring, September-October 1989, and the offer of China to host a biological effects workshop in 1991.

126 Several Delegates offered or reconfirmed offers to host GIPME-related meetings, workshops and training activities.

127 **The Assembly adopted** Resolution XV-5.

5.4.2 JOINT GLOBAL OCEAN FLUX STUDY (JGOFS)

128 The Representative of SCOR provided information on recent JGOFS development to supplement that which was provided in IOC-XV/8 Annex 2, specifically noting that additional national programmes were being developed and, as a result, the representation in JGOFS was increasing. The present line of communication between IOC and JGOFS was noted as being particularly effective.

129 In general, Delegations expressed their appreciation over the developments in JGOFS, and it was agreed that the present link between IOC and JGOFS through GIPME be maintained since it was functioning effectively. It was proposed and agreed upon, that an ad hoc consultation be arranged under the chairmanship of the Chairman of the Scientific Committee for GIPME, to consider areas in JGOFS, based on its scientific plan, where IOC could provide assistance. A report from this ad hoc consultation should be available for consideration by IOC-XVI.

5.4.3 ENVIRONMENTAL IMPACT STUDIES

130 **The Assembly took due note,** particularly with reference to Document IOC/INF-771 'Regional Assessments, Geosphere-Biosphere Observatories, Past Global Changes, and IOC's Potential Role', of the evaluations and interpretations of scientific findings produced through the work of several Groups of Experts related to the GIPME Programme, as well as several regional groups, often in co-operation with UNEP, and the close relationship of this work with considerations of environmental impacts. Endorsement was given to continue work on environmental impact studies, including co-operation with relevant bodies.

5.5 THE ICSU INTERNATIONAL GEOSPHERE-BIOSPHERE PROGRAMME (IGBP)

131 Dr. Neil Andersen, Chairman of the ad hoc meeting on Potential IOC Involvement in the Oceanographic Components of the International Geosphere-Biosphere Programme (Paris, 29-30 June 1989), introduced the Agenda Item, referring to Document IOC-XV/8 Annex 3. He noted that the ad hoc meeting was held pursuant to Resolution XIV-6 of the Fourteenth Session of the Assembly.

132 Several Delegates strongly endorsed IOC's involvement in the IGBP and made specific suggestions as to subject areas which could be considered, in particular the potential establishment of permanent oceanographic stations and marine geosphere-biosphere observatories, emphasizing the important role of IOC in this connection.

133 **The Assembly stressed** that additional resources, both monetary and manpower, would have to be made available to allow the IOC to contribute fully to the IGBP.

134 **The Assembly adopted** Resolution XV-6.

5.6 OCEAN SCIENCE IN RELATION TO LIVING RESOURCES (OSLR)

135 **The Assembly decided** to introduce this item on the Agenda mainly for an exchange of information.

136 The Senior Assistant Secretary for OSLR, Dr. Jürgen Alheit, recalled that the Ocean Science in relation to Living Resources Programme, co-sponsored by IOC and FAO, presently focuses on two major sub-programmes: the International Recruitment Project (IREP) and the programme on Red Tides and Ocean Blooms.

137 IREP, through the Sardine/Anchovy Recruitment Project (SARP) and the Tropical Demersal Recruitment Project (TRODERP), has made considerable progress over the last 12 months, particularly through implementation at the regional level.

138 The second major OSLR programme, Red Tides and Ocean Blooms, was advanced further by IOC and its Sub-Committee for WESTPAC co-sponsoring a training workshop in Brunei in May 1989 and, in Lund, Sweden, in June 1989, a Symposium on 'Toxic Phytoplankton Blooms. An ad hoc Expert Consultation on Red Tides and Ocean Blooms with participation of experts from parts of the GIPME programme and the new programme initiative on Physical Oceanography on Continental Shelves will be held in November 1989.

139 The Senior Assistant Secretary informed the Assembly of recent developments in the programme supplementing the information provided in Document IOC-XV/6. In particular, he referred to the international cruise in the South-West Atlantic planned for the RV "METEOR" in November/December 1989 with 28 scientists, 15 of whom will be from the region, to investigate recruitment of the South-West Atlantic anchovy; to the planned Second Workshop on Prawn Recruitment in the WESTPAC region (September 1989, Phuket, Thailand), and to the discussions at the General Fisheries Council for the Mediterranean (February 1989) on the initiation of a project on "Long-Term Trends and the Interaction of Fisheries with the Environment in the GFCM Area" with IOC involvement.

140 The ad hoc meeting on possible involvement of IOC in the International Geosphere-Biosphere Programme noted that no special programme is foreseen within IGBP on the impact of predicted global climate change on marine living resources. In view of its particular relevance to developing countries, **the Assembly suggested** that OSLR could make a valuable contribution to the IGBP in this field.

141 A course on the "Egg Production Method for Spawning Biomass Estimates", an essential part of the IREP Minimum Plan, was held in December 1988 in Bremerhaven, Federal Republic of Germany, with 25 participants from 11 nations, the majority from South America. A course on SARP methods will be held in Bremerhaven, in September 1989. Both courses are sponsored by the Federal Republic of Germany.

142 A large number of Delegates emphasized the high priority their countries accord to the programme and provided information about their national OSLR activities, stating their interest in continuing and strengthening these initiatives.

143 Several Delegates stated the importance of the programme on Red Tides and Ocean Blooms, drew attention to the socio-economic impacts of toxic algal blooms and encouraged increased activity in this field. Various Delegates pointed out that OSLR projects have so far not been implemented in some large regions such as IOCINDIO and IOCEA. Several Delegates suggested that OSLR should build links with major national

and international programmes such as JGOFS, GLOBEC and the Large Marine Ecosystems initiative, and **the Assembly endorsed** the initiation of this interaction by the Secretariat. It particularly **emphasized** an increased co-operation at the regional level with international organizations such as the FAO.

144 **The Assembly expressed** its satisfaction with the considerable progress being made in OSLR and, in particular, its regional emphasis and associated training courses.

145 **The Assembly took note** of the excellent co-operation between IOC and ICES, particularly in regard to SARP.

146 **The Assembly voiced** its deep concern about the future of the OSLR Programme when the secondment of the Senior Assistant Secretary for OSLR ends in March 1990 because no replacement has been identified.

147 The Representative of FAO stressed his Organization's satisfaction with this joint IOC-FAO Programme and, in particular, the possibility to increase co-operation at the level of the regional subsidiary bodies of the co-sponsors. He informed the Assembly of the particular interest, in the Mediterranean region, in increasing the interaction between the fishery and oceanographic communities, and expressed the belief that, if such co-operation proved fruitful, it would be readily applied in other ocean regions. He stressed the growing concern, in FAO and its regional fishery bodies, over the increasing frequency of red tides and related phenomena, and also indicated the need to determine the possibility of incorporating biological observations, in due course, into regional oceanographic programmes.

6. OCEAN SERVICES

6.1 INTEGRATED GLOBAL OCEAN SERVICES SYSTEM (IGOSS)

148 The Chairman of the Joint IOC-WMO Working Committee for IGOSS, Dr. Yves Tourre, presented the major thrusts in IGOSS development, led by the considerably increased requirements for global ocean monitoring and operational oceanographic data and products by various user communities and international programmes. Three priority areas were identified to further the System: (i) preparation and dissemination of global operational ocean products; (ii) implementation, jointly with IODE, of a global temperature/salinity pilot project; and (iii) increased operational data submission, with special emphasis on salinity data.

149 To achieve these goals, the Working Committee adopted the IGOSS Plan and Implementation Programme 1989-1995, considered as fitting in well with existing requirements in the field of operational oceanography and as a potential tool for providing a wide range of users with information and guidance on IGOSS. Note was made of the close relationship and co-ordination of activities being established between IGOSS and IODE on the one hand, and IGOSS and the WMO Commission for Marine Meteorology (CMM) on the other. As for the latter, **the Assembly expressed** particular appreciation for the joint development of long-term postgraduate training courses in the field of marine meteorology and physical oceanography. **The Assembly emphasized** that IGOSS and IODE have distinct goals but that it is crucial that a close working relationship be established between the two systems, such as through the proposed Joint Task Team.

150 **The Assembly welcomed** the initiative by Canada to hold a Symposium on Operational Fisheries Oceanography in St. John's, Newfoundland, (23 to 27 October 1989) and **considered** that the Symposium would assist in better defining which, and how, economic benefits can be derived from IGOSS. **The Assembly also noted** requests for assistance on the part of some Member States to enable them to better participate in IGOSS, and **urged** potential donor countries to favourably consider these requests.

151 **The Assembly noted** that the Executive Council of WMO, at its Forty-first Session (Geneva, 5-17 June 1989), adopted, inter alia, Resolution 10 (EC-XLI) - Joint IOC-WMO Committee for the Integrated Global Ocean Services System (IGOSS) - in which it decided that: (i) the title of the Joint IOC-WMO Working Committee for IGOSS be amended to the Joint IOC-WMO Committee for IGOSS, and (ii) the terms of reference, membership and chairmanship for the Joint Committee will conform with those prepared according to the Guidelines for the Structure and Responsibilities of the Subsidiary Bodies of the Commission. **The Assembly expressed** its gratefulness to the WMO Executive Council for having kindly agreed to comply with IOC's rules in this matter.

152 **The Assembly accepted** the Summary Report of the Fifth Session of the Joint IOC-WMO Working Committee for IGOSS (Paris, 14-23 November 1988; Document IOC-WMO/IGOSS-IV/3) **and recorded** its decisions on the resolutions and recommendations in Resolution XV-7.

6.2 OCEAN OBSERVING SYSTEMS

6.2.1 GLOBAL SEA-LEVEL OBSERVING SYSTEM (GLOSS)

153 The Chairman of the Group of Experts on GLOSS, Dr. David Pugh reported on the progress in the implementation of GLOSS. He particularly referred to the outcome and recommendations of the First Session of the IOC Group of Experts on GLOSS held at the Proudman Oceanographic Laboratory, Bidston Observatory, United Kingdom, from 19 to 23 June 1989, which were submitted to the Third Session of the IOC Technical Committee on Ocean Processes and Climate (Paris, 27-29 June 1989). Recommendation TC-OPC-III.4 on GLOSS was submitted to the Assembly in Document IOC/TC-OPC-III/3S.

154 **The Assembly noted** with satisfaction the progress in the implementation of GLOSS, with support and active participation of many Member States. **The Assembly also noted** that still more effort was required by Member States to set up the GLOSS network in various oceanic regions, particularly in the tropical and South Atlantic and in Antarctica, and to ensure regular and timely submission of sea-level data from operational GLOSS stations to the international Centres, in accordance with the GLOSS implementation plan.

155 **The Assembly urged** Member States to participate in the proposed IGOSS Sea-Level Pilot Project in the North and Tropical Atlantic (ISLPPNTA) by providing monthly mean sea-level data to SOC for ISLPPNTA (MEDS, Canada).

156 **The Assembly noted** with satisfaction the activities and plans of Japan, USSR, Poland and Germany (Federal Republic of), for the establishment of tide-gauges in Antarctica. The usefulness of the Workshop on Sea-Level Measurements in Hostile Conditions, held at Bidston, United Kingdom, 28-31 March 1988, was pointed out in this connection. **The Assembly urged** Member States to intensify their efforts to establish GLOSS stations in Antarctica and requested the TC/OPC and its Group of Experts on GLOSS to give this matter particular consideration, in co-operation with SCAR and the Regional Committee on SOC.

157 **The Assembly welcomed** the proposal of Australia to develop the IGOSS Sea-Level Pilot Project in the Southern Ocean with the support of Australia and **requested** TC/OPC and GE/GLOSS to consider this proposal at their next sessions.

158 **The Assembly also welcomed** the proposal of Cuba to organize a sea-level training Seminar for specialists of the IOCARIBE region in 1989 and **requested** the IOCARIBE and the Secretary IOC to provide assistance for its organization.

159 Many Delegates reported on their GLOSS activities and emphasized the importance of GLOSS for global change studies and also for TOGA, WOCE, and IGBP, as well as for regional and national research and operational applications.

160 **The Assembly agreed** that the regional subsidiary bodies of IOC should assist, to the extent possible, in GLOSS development and implementation in their respective regions, as well as in relevant assistance and training programmes.

161 **The Assembly noted** that the progress in GLOSS had been achieved due to substantial support provided by several countries (Australia, France, Germany (Federal Republic of), India, Portugal, Sweden, United Kingdom and the USA) in the form of provision of equipment, installation of tide-gauges and training of specialists, organized on a bilateral, and/or a multilateral basis, or through IOC, and **encouraged** Member States to continue and expand such assistance and support.

162 Some Delegates pointed out the need to develop new code forms and procedures for the exchange of real-time sea-level data via GTS. **The Assembly requested** the Joint IOC-WMO Committee for IGOSS, in consultation with the Group of Experts on GLOSS, to consider this proposal and to initiate appropriate action.

163 Some Delegates pointed out that sea-level measurements within the framework of GLOSS are of great importance for storm-surge studies and prediction, in particular in the IOCINDIO region. The existing network in some countries of the IOCINDIO region needs up-grading including the replacement of old-type tide gauges by automatic systems for sea-level measurement and transmission. **The Assembly requested** the Secretary IOC and the Regional Committee for IOCINDIO to give particular attention to the implementation of GLOSS in the region.

164 **The Assembly adopted** Resolution XV-8.

6.2.2 DRIFTING-BUOY CO-OPERATION PANEL (DBCP)

165 The Agenda Item was introduced by the Assistant Secretary, Mr. Y. Treglos, on the basis of which **the Assembly reviewed** the activities under the Drifting-Buoy Co-operation Panel and, in particular, the Panel's Annual Report for 1988, along with information provided in the Action Paper and in the Report of the Secretary (Documents IOC-XV/8 and 6, respectively). **The Assembly expressed** its appreciation for the work of the Panel and, in particular, for the efforts devoted to assisting and encouraging Argos users to disseminate their data on the Global Telecommunication System (GTS) of WMO, in conformity with its term of reference No.5. In this respect, **the Assembly noted** with concern the reluctance within a significant part of the researcher community to allow their data to be made available globally in real-time over the GTS. This is probably mainly due to the fact that scientists wish to retain access to original, unmodified data. In order to cater for the concern of the scientists producing the data, an entirely separate and modular processing chain for GTS data is needed at the Argos Global Processing Centres in Toulouse, France and Landover, MD, USA. **The Assembly therefore concurred** with the Panel in feeling it important that early consideration be given to the development of such a facility and in requesting CLS/Service Argos to take the necessary steps to define more closely the system and associated costs.

166 **The Assembly further commended** the Panel on the work accomplished with regard to quality control of drifting-buoy data. **It stressed** that drifting buoys, to fulfil their potential as basic tools in marine scientific or operational activities, have to deliver data of unquestionable quality. In this context, appreciation was expressed to the European Centre for Medium-Range Weather Forecasts (ECMWF) for its support to the data quality control exercise through providing the Technical Co-ordinator with monthly statistics comparing buoy pressure observation with the ECMWF first-guess field.

167 **The Assembly expressed** full agreement with the Panel's opinion that it needed a full-time Technical Co-ordinator, closely associated with both Secretariats, to successfully achieve its objectives. **The Assembly therefore thanked** those Member States which were contributing to funding the position of Technical Co-ordinator and urged other Member States to consider participating in this financial effort. In this regard, **the Assembly took note** that funds provided to support the position were now

managed by WMO instead of IOC as had been the case previously. It **requested** the Secretary to ensure that these arrangements were appropriate.

168 **The Assembly expressed** the view that the concept of regionalization was a very important one for the Panel's work. The example of the European Group on Ocean Stations (EGOS), which is an "action group" of the Panel as far as its drifting-buoy activities are concerned, was highlighted. **The Assembly encouraged** Member States who consider that special attention should be given to specific ocean regions, to make their standpoint known to the Panel before its forthcoming session (Geneva, October 1989), where this item was expected to be given particular attention.

6.3 INTERNATIONAL OCEANOGRAPHIC DATA AND INFORMATION EXCHANGE (IODE)

6.3.1 DATA EXCHANGE

169 The Chairman of the Technical Committee on IODE, Dr. N. Flemming, presented his report on the recent progress in the Commission's international oceanographic data and information activities (Document IOC/INF-778). The report includes information on: (i) the meetings of TC/IODE's subsidiary bodies, status of global data exchange, and co-operation of TC/IODE with global scientific programmes such as TOGA, WOCE, JGOFS, and IGBP; (ii) new data types and processing, IODE products and services; (iii) development of new technology and systems for data-analysis and display, and exchange of data; and (iv) training activities in the field of oceanographic data management and the use of micro-computers. He informed the Assembly on the results of the Sixth Session of the IODE Consultative Meeting (Paris, 13-15 March 1989) and on preparations for the Thirteenth Session of the Technical Committee on IODE to be held 17-24 January 1990 at the UN Headquarters, New York.

170 **The Assembly welcomed** the Report of the Chairman of the Technical Committee on IODE.

171 **The Assembly expressed** concern that the lack of staff in the IOC Secretariat, and financial support for IODE, did not allow the implementation of all approved IODE activities, especially those designed to strengthen training and experience for marine data managers in developing countries and to provide practical assistance for projects and course organization and expert visits.

172 **The Assembly therefore requested** the Secretary IOC and the Chairman TC/IODE to develop specific proposals with regard to the increased financial support required to meet the needs of IODE and to report on this matter at the Twenty-third Session of the IOC Executive Council.

173 The Delegate of China informed the Assembly that, at the last session of ICSU, in accordance with the recommendations of the ICSU World Data Center Panel (August 1988), the plans of China to establish a WDC-D Oceanography co-located with its NODC were endorsed. The Delegate of China invited the WDCs A and B (Oceanography) and the Technical Committee on IODE to assist WDC-D in assuming its future functions and responsibilities.

174 Some Delegates noted that IOC would need to receive a formal resolution from ICSU, confirming the designation of WDC-D (Oceanography) in China, with the full terms of reference, and acceptance by China to fulfil the obligations of a state hosting a WDC fully in accordance with the regulations of ICSU. Upon receipt of such formal statements, the Technical Committee on IODE should consider this matter at its Thirteenth Session.

175 **The Assembly stressed** the need to strengthen interaction with ICSU and its WDC Panel with regard to formulation of co-ordinated policy on international oceanographic data exchange and activities of WDCs. **The Assembly therefore requested** the Secretary IOC to arrange consultations with ICSU on this matter without delay.

The Assembly also requested the Technical Committee on IODE at its Thirteenth Session to consider those matters of common interest and responsibility to IOC and ICSU and to submit its conclusions to the Twenty-third Session of the IOC Executive Council.

176 **The Assembly was of the view** that the responsibility for operation of NOPs, ROSCOP and MEDI as important tools for monitoring of data flow should be left with the IOC Secretariat. It was noted, however, that the assistance of WDCs, which already handle ROSCOP information, would be needed in view of the shortage of staff and budget.

177 Many Delegates pointed out the need for assistance in improving the data management capabilities of countries participating in IOC regional activities and programmes.

178 **The Assembly noted** with appreciation the assistance provided by Canada, Japan, Thailand and the UK in organizing training courses and seminars on oceanographic data management and welcomed the renewed offers of the USSR and Japan to arrange training courses in 1989 and 1990-1991 and of Colombia and Greece to host future training activities. **The Assembly also wished** to emphasize that such IODE-related training and assistance programmes should be given more attention by the IOC regional bodies. **The Assembly invited**, therefore, IOCARIBE and IOCEA and other regional bodies to give particular attention to this matter at their forthcoming meetings.

179 **The Assembly noted** that the growing volume of oceanographic data from new ocean observing systems, together with the importance of quality control of the data and the monitoring of data flow in various regional IOC activities, requires more support from Member States through performing the functions of an RNODC. The successful activities of JODC acting as RNODC for WESTPAC were cited in this connection.

180 **The Assembly strongly supported** the close interaction and interface of the TC/IODE programme with large-scale scientific experiments, such as TOGA, WOCE, JGOFS, IGBP. In this connection, **the Assembly welcomed** the initiative of the Technical Committee to organize an IOC Workshop on Ocean Climate Data early in 1991 or late in 1990, as a major step in co-operation with global ocean science programmes and to address various matters regarding ocean data handling in support of ocean climate studies, including management of satellite remotely-sensed oceanographic data. **The Assembly instructed** the Secretary, to make the necessary preparations for the Workshop and invited Member States to support participation of their specialists in the Workshop.

181 Several Delegates expressed strong support for the IODE-IGOSS Task Team and complimented the Chairmen of IODE and IGOSS for having arranged an ad hoc meeting of the Task Team during IODE-XIII in January 1990.

182 Noting its potential to serve global ocean science programmes, **the Assembly welcomed** a proposed Global Temperature Salinity Pilot Project uniting historical IODE data holdings and quality-controlled IGOSS real-time data in a continuously updated integrated database and approved the holding of an IODE Workshop on the project (15-17 January 1990, New York) immediately preceding IODE-XIII.

183 **The Assembly noted** that technical progress in ways of observing the ocean, and in data processing and telecommunications, requires a corresponding progress in IODE methods and procedures and **urged** the TC-IODE to continue its work on and give special emphasis to : (i) the GF3 data formatting system, (ii) preparation of a small Workshop on Application of New Computer Technology and Telecommunications to Oceanographic Data Management and (iii) the application of microcomputers to oceanographic data processing and management.

6.3.2 MARINE INFORMATION MANAGEMENT

184 The IOC Assistant Secretary, Mr. T. Sankey, drew the Assembly's attention to new developments in this programme, including recent inter-Secretariat consultations with FAO on the development of the FAO-IOC-UN Aquatic Sciences and Fisheries Information System (ASFIS) and the decisions of the 1989 Aquatic Sciences and Fisheries Abstracts (ASFA) Advisory Board Meeting (Rome, 12-16 June 1989).

185 The Representative of FAO expressed the appreciation of his organization for the support being given by the IOC to the FAO-IOC-UN ASFIS, particularly in the formulation of expert advice and the provision of training.

186 **The Assembly expressed** its appreciation for the support to training and assistance activities in marine information management provided by numerous countries.

187 **The Assembly confirmed** the strong support given by the Twenty-first Session of the IOC Executive Council to the strategy for the marine information management endeavours of the Commission prepared by the ad hoc Consultation of Experts on Marine Information Management, Enghien-les-Bains, France, October 1987.

188 **The Assembly welcomed** the actions being taken to improve the usefulness to scientists of the ASFA database, the ASFA printed journal and ASFA CD-ROM products, and approved the increase of IOC financial support to ASFA production in 1990-1991.

189 In noting the value to Member States of up-to-date directories of marine scientists and institutions, **the Assembly requested** the Secretary IOC to prepare concrete proposals for presentation to the Thirteenth Session of the TC-IODE, and to forthcoming Sessions of IOC Regional Bodies, based on consideration of: (i) the importance of delivering this information to the developing countries, (ii) the respective advantages of printed products and of computerized databases, (iii) the possibilities for collaboration with existing and planned national and regional directories and with commercial publishers, (iv) the potential role of IOC Regional Bodies in co-ordinating regional data collection and the production of regional directories and (v) the probable level of IOC Secretariat resources.

190 **The Assembly noted** the particular importance of information exchange in developing countries.

191 **The Assembly was informed** that in the IOCINCWIO Region the RECOSCIX-WIO (Regional Co-operation for Scientific Information Exchange - Western Indian Ocean) project, approved at the Second Session of IOCINCWIO, aimed at the establishment of a marine information network within the framework of ASFIS, has now started. The project is planned to develop co-operation with, and to be of real service to, the programmes of other UN bodies concerned with marine science in the region. **The Assembly emphasized** the need to provide adequate equipment to participating laboratories and to organize training for the personnel involved in the project, and **instructed** the Secretary IOC to seek extra-budgetary funding for the full implementation of the project.

192 Several Delegates noted the need to provide training in marine information management to other developing regions. **The Assembly** was pleased to **note** that work had commenced on preparation of an Introductory Manual for Marine Information Centre Development. **The Assembly approved** plans to develop a training strategy for ASFIS which will define project proposals for the development of training packages, incorporating guidelines and course material, which can then be applied to meet the needs of developing countries and regions.

193 **The Assembly noted** with concern that repeated calls for increased resources for this programme, notably in Resolutions XIV-9 and EC-XXI.5, had not led to the required increase in staff and financial resources and unless these are

forthcoming the various activities mentioned above will have to be postponed once again. This aspect was considered further under Agenda Item 9.2.

194 **The Assembly endorsed** the development of improved co-ordination arrangements for the ASFIS Secretariat function between IOC, FAO and the United Nations Office for Ocean Affairs and the Law of the Sea, and renewed the invitation made in Resolution XIV-9 for the FAO and the UN to jointly sponsor with the IOC an advisory body for ASFIS.

195 **The Assembly also recognized** the need for collaboration with all organizations concerned with marine science information, both governmental and non-governmental. Noting the growth of the International Association of Marine Science Libraries and Information Centers (IAMSLIC) and of several regional marine librarians groups, **the Assembly requested** the Secretary IOC to pursue further the contacts initiated with these groups with a view to building up their co-operation with ASFIS.

7. REGIONAL SUBSIDIARY BODIES AND CO-OPERATION

7.1 IOC REGIONAL COMMITTEE FOR THE CENTRAL INDIAN OCEAN (IOCINDIO)

196 The Chairman of IOCINDIO, Dr. G. S. Quraishee (Pakistan), reported on programme activities initiated at the First Session of the IOCINDIO Regional Committee (3 - 7 July 1988; Document IOCINDIO-I/3).

197 As this was the first presentation by IOCINDIO to the Assembly, the Chairman provided the Delegates with a brief history of events preceeding the 1988 meeting, and reviewed the unique characteristics of the geographical area which forms the framework for the programme's goals and objectives.

198 **The Assembly approved** the eight projects which will be implemented within the framework of IOCINDIO, in addition to studies related to TOGA and WOCE. These are: Coastal Water Dynamics, Regional Component of the IOC Global Sea-level Observing System (GLOSS), Storm Surge Prediction, Living Resources of the Northern Arabian Sea and a study of red tides in the IOCINDIO region, Geological Survey of the Continental Shelf in the Central Indian Ocean and a study of riverine sediment inputs to the Indus Cone, and Monitoring and Assessment of Marine Pollution Levels in the IOCINDIO Region. The Assembly was also informed of activities planned in relation to ocean mapping, IGOSS, and data exchange.

199 The Chairman expressed his appreciation to those Member States who have provided assistance to IOCINDIO Programmes either directly or through their scientific organizations.

200 Several Delegates agreed that the Indian Ocean required more study so that the oceanographic and meteorological processes in the region could be more clearly defined. These investigations would not only describe the regional aspects of the Indian Ocean System but would also contribute valuable insights to global scale projects (e.g., TOGA, WOCE). Mention was made of the importance of storm surge predictions, especially in the Arabian Sea and Bay of Bengal, and of the requirement for detailed hydrographic surveys and modern tide-gauge networks to provide the data base necessary to produce timely warnings. It was noted that a project proposal for this purpose had been developed with the support of IOC, involving the assistance of CIDA, and had been circulated to interested Member States for comment.

201 **The Assembly noted** that increased intra-regional and internal co-operation, between national and international agencies within Member States, was vital to the success of these efforts, since such co-operation can ensure that assistance and training are provided in the most cost-effective and beneficial manner.

202 One Delegate suggested that consideration be given to the formation of an IOC Regional Sub-commission for the Indian Ocean which would coordinate the activities of the regional bodies now in existence there. This proposal received support from the Assembly and should be considered in due course.

203 **The Assembly agreed** that increased co-operation between WESTPAC and IOCINDIO is a necessary step towards the understanding of the processes through which the two oceanic regions interact. The Arabian Sea, the Western Indian Ocean, and the Gulf were also recognized as very important regions, both oceanographically and economically. One Delegate suggested that an IOC Advisory Panel on the Gulf and Arabian Sea be formed; the Delegate of Iran offered to host the Third meeting of the Working Group on Ocean Dynamics and any other meetings related to ocean monitoring and marine resources.

204 **The Assembly endorsed** the Report, the geographical area, and the Terms of Reference as given in Document IOCINDIO-I/3.

7.2 PROPOSAL FOR THE ESTABLISHMENT OF A SUB-COMMISSION FOR THE WESTERN PACIFIC (WESTPAC)

205 The Chairman of WESTPAC, Professor T. Nemoto, introduced the item drawing attention to Recommendation WESTPAC-IV.1 adopted by the Regional Committee at its Fourth Session, and the decision taken by the IOC Executive Council at its Twenty-first Session to request the Assembly to consider the proposal for the creation of an IOC Sub-Commission for WESTPAC and associated secretariat arrangements. Highlighting the main aspects of intersessional activities, he particularly referred to progress in negotiations with the authorities of the Government of Thailand following their offer to host the IOC Regional Secretariat for WESTPAC, and to the offer of the People's Republic of China to host the next session of WESTPAC. He summarized the considerable progress made in respect of the co-operative research projects adopted by the Regional Committee and other related activities described in the reference documents (Document IOC-XV/6; Document IOC/INF-773). He made special reference to the positive actions taken in respect of seven out of nine projects adopted by WESTPAC, increased participation of Member States in the various programmes and, in particular, to the growing co-operation amongst the various institutions in the region. He expressed appreciation to the Governments of Australia, Japan and the USA for their financial and in-kind support given to enhance collaboration between researchers from WESTPAC's developing and developed countries. Finally, he reported to the Assembly that despite very limited resources available to the Regional Committee, the latter has demonstrated its effectiveness as an initiator and co-ordinator of collaborative research in the region.

206 The Delegate of Thailand reiterated his Government's offer to provide office space for an IOC Regional Secretariat for WESTPAC, including office equipment and local administrative expenses in the amount of US $13,000. He said the IOC Regional Secretariat for WESTPAC would be temporarily housed in the premises of the National Research Council of Thailand until permanent office space could be provided in a new building, planned to be constructed in the premises of the Unesco Regional Office in Bangkok. He expressed the hope that the Member States of the Commission would make contributions in kind and in cash, to ensure proper functioning of the IOC Regional Secretariat and requested the Assembly to decide on a definite time frame for such a Secretariat to be established.

207 Many Delegates complimented the Chairman for his efforts and for his report on intersessional activities and also expressed appreciation for the documents prepared by the Secretariat which provided a comprehensive review of the evolution of WESTPAC during the past ten years.

208 A number of Delegates noted that many developing countries in the region, particularly the ones in South-east Asia, have increased their capabilities for marine

scientific research as reflected in a significant increase in the number of marine science institutions and marine scientific manpower. It was also pointed out that many of these countries are actively participating in several of the co-operative research projects that have a bearing on specific regional problems, as well as in global programmes of the Commission in ocean science and ocean services.

209 **The Assembly recognized** that the WESTPAC programme and activities have advanced to a level where it is necessary to ensure that the two on-going processes, namely consolidation of marine science by the majority of the developing countries, and the advanced marine research being carried out by other developed countries, can be mutually supportive in the fulfilment of WESTPAC's long-term objectives.

210 Commenting on the establishment of an IOC Regional Secretariat for WESTPAC, **the Assembly stressed** that, as for all such bodies, the Sub-Commission should operate within the framework of its parent body, in close liaison with the IOC Secretariat in Paris, and that the proposed Regional Secretariat should be headed by an IOC-Unesco staff member.

211 The Delegate of the United States endorsed the establishment of a Sub-Commission for WESTPAC and offered to increase its present support for WESTPAC to cover half of the cost of a senior professional staff member to be assigned to the IOC Regional Secretariat for WESTPAC, with the proviso that Unesco-IOC would provide the other half. The Delegate of Japan expressed the willingness of his Government to continue its active participation in and contribution to WESTPAC programmes, covering such activities as inviting researchers from developing countries on board its research vessels and organizing short training courses on marine data management, etc. He also informed the Assembly that his Government will continue its financial contribution to WESTPAC programmes which amounts to US $30,000 each year in the form of Funds-in-Trust, and that, with regard to the IOC Regional Secretariat for WESTPAC, his Government is ready to provide an IOC Associate Expert, through the Unesco mechanism, to work at the proposed Secretariat. The Delegate further informed the Assembly that the new HAKUHO-MARU cruise of 1992 to the Equatorial Pacific around the Caroline Islands will study the "Margin of Active Plates", which is one of the OSNLR projects of WESTPAC, and will be declared a "WESTPAC Cruise" in order to invite Member States to participate. The Delegate of Australia stated his Government's intention to continue to provide financial support to WESTPAC programme implementation. The Delegate of China reiterated his Government's invitation to the IOC to host the next Session of WESTPAC in Hongzhu, early in 1990.

212 The Assembly was informed that some regional non-governmental organizations, such as the Pacific Science Association (PSA), had invited the Regional Committee for WESTPAC to consider convening joint seminars and symposia. The Japan East China Seas Study (JECSS) had also expressed similar wishes. Speaking for the PSA, Dr. V. Ussov provided details on the proposal with respect to its Marine Sciences Committee referring to the Second Pacific Symposium on Marine Sciences (Nakhodka, USSR, 12-19 August 1988) and the Chairman of the Regional Committee provided detailed information with respect to JECSS.

213 **The Assembly noted** with satisfaction the progress made by WESTPAC in planning, developing and implementing its various programmes and activities during the intersessional period. **It also noted** that many countries in the region have increased their capabilities for marine research and demonstrated their interest in actively participating in regional implementation of IOC global programmes as well as in other co-operative research projects of regional significance.

214 **The Assembly stressed** that the Work Plan of the Sub-Commission should, inter alia: ensure effective implementation of the initial work programme and activities endorsed by WESTPAC-IV; further strengthen the broadly based organizational structure of Programme Co-ordinators and provide direction and assistance to them in the development, implementation and management of projects; develop regional and sub-regional projects based on the priorities identified for possible assistance from

other international sources; and develop co-operative relations with other bodies in the region.

215 **The Assembly thanked** the Government of China for offering to host the Fifth and Final Session of the Regional Committee, followed by the First Session of the Sub-Commission and decided that it should be convened in early 1990 in China.

216 **The Assembly expressed** thanks to the Government of Thailand for its generous offer to host the IOC Regional Secretariat for WESTPAC including the provision of a permanent office and related office facilities and local staff, at the premises of the Unesco Regional Office in Bangkok.

217 **The Assembly acknowledged** with thanks the offer made by the Delegate of the USA for financial support to meet half the cost of a senior professional staff member, the offer of the Government of Japan to provide an associate expert to be recruited at the IOC Regional Secretariat for WESTPAC and the offer of the Government of Australia to continue to provide financial support to the implementation of the programme of the Sub-Commission.

218 **The Assembly decided** to establish the IOC Regional Secretariat for the Sub-Commission for WESTPAC in Bangkok as soon as the arrangements for the location of the office can be finalized. It would be useful for the staff of this Secretariat to spend at least a short period at the IOC Secretariat in Paris in order to become familiar with the IOC and Unesco.

219 **The Assembly recognized** that the IOC Regional Secretariat for WESTPAC will need additional funding for its proper functioning as well as for its programme implementation. **It therefore urged** Member States of the Commission to make voluntary contributions to the IOC Trust Fund earmarked for support to the Sub-Commission and its Secretariat, or to contribute under the VCP and/or to provide other forms of support in kind for their activities.

220 **The Assembly recognized** that the Regional Committee is considering the convening of a Second WESTPAC Symposium, possibly mid-way between the First and Second Sessions of the new Sub-Commission.

221 **The Assembly noted** with interest the proposal by some regional non-governmental organizations, in particular the PSA, to hold joint seminars or symposia and instructed the Secretary of IOC, in consultation with the Chairman of WESTPAC, to investigate the feasibility of implementing such proposals. It was noted that the scheduling of such seminars/symposia would have to be considered in conjunction with the scheduling of other WESTPAC activities.

222 **The Assembly adopted** Resolution XV-9.

7.3 JOINT IOC-WMO-CPPS WORKING GROUP ON THE INVESTIGATIONS OF EL NINO

223 Dr. F. Robles, Technical Secretary for the Joint Working Group, introduced this item, referring to Document IOC-WMO-CPPS/El Niño-VI/3. The various activities sponsored by the IOC in the South-Eastern Pacific region are performed jointly with the CPPS under the standing agreement of regional co-operation signed by both organizations in April 1984. In addition to Colombia, Chile, Ecuador and Peru (the CPPS Member States), Panama also takes part in some activities. IOC participation is implemented mainly through the IOC Regional Secretariat for IOCARIBE, Cartagena, Colombia and covers a wide range of regional components on Ocean Dynamics and Climate, Marine Pollution Research and Monitoring, OSLR, and associated ocean services and observing systems such as IGOSS and GLOSS. Recently, and as a follow-up of Recommendations of the CPPS-UNEP-IOC-ECLAC-IOI Experts Meeting on Co-operation in Ocean Mining and Uses of the Sea: Scientific, Technical, Legal, Environmental and Planning Components (Quito, Ecuador, 12-16 June 1989), IOC and CPPS are considering the

development of a South-Eastern Pacific component on OSNLR including co-sponsorship of a Joint CPPS-IOC Group of Experts. Many of these activities include a strong TEMA element. The joint IOC-WMO-CPPS Working Group on El Niño, in particular, has proved to be (in co-ordination with CPPS's ERFEN) a good mechanism to assist in the implementation of oceanic components of the WCRP, including regional implementation of TOGA and WOCE. The IOC-CPPS Regional Project on Monitoring and Prediction of the El Niño Phenomenon in the South-east Pacific: Application to Development, with funds reserved by UNDP amounting to US $203,700, was reviewed and endorsed during the Sixth Session of the Joint Working Group (Vina del Mar, Chile, 24-26 November 1988). This Session also recommended to CPPS the publication of a near-real-time bulletin on climate alert with the support of IOC and WMO.

224 **The Assembly acknowledged** with satisfaction the report presented on the IOC activities in the South-Eastern Pacific region and the on-going collaboration with CPPS.

225 The Representative of CPPS thanked IOC for its continuous support to several CPPS activities, and expressed concern about delay in initiating the IOC-CPPS El Niño project funded by UNDP. He called attention to the great effort made by CPPS countries through the ERFEN programme and re-stated the need to maintain the CPPS-IOC co-ordinating unit of the project in the CPPS Secretariat as mentioned in the project document.

226 The Chairman of the CCCO emphasized the importance of the Joint Working Group for the regional components of TOGA and WOCE and requested the support of IOC and WMO for the regional publication of the bulletin on climatic alert.

227 **The Assembly endorsed** the Summary Report and Recommendations of the Sixth Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of El Niño.

228 **The Assembly approved** support of IOC and **requested** the support of WMO for regional publication of a bulletin on climatic alert.

229 **The Assembly urged** endorsement by CPPS Member States of the project document of the IOC-CPPS Project on Monitoring and Prediction of the El Niño Phenomenon in the South-east Pacific: Application to Development, once it is officially received in its present version by the governments concerned.

230 **The Assembly requested** IOC Member States to make appropriate use of the Joint Working Group in the implementation of oceanic components of the WCRP.

7.4 MEDITERRANEAN

231 The Assistant Secretary, Mr. G. Soares, presented the proposal for an International Research Programme in the Western Mediterranean (PRIMO) on Physical Oceanography and referred to Document IOC/INF-772. He also informed the Assembly of the progress made in implementing the study of the Physical Oceanography of the Eastern Mediterranean (POEM), which is co-sponsored by IOC and Unesco.

232 PRIMO has been developed and would be supported and implemented under the joint sponsorship of IOC and ICSEM within the framework of the Memorandum of Understanding on the co-operation between the two Organizations.

233 At this stage it is proposed that an ad hoc group of experts be established in consultation with ICSEM to assist in the implementation.

234 The Third POEM Workshop was held at Harvard University, Cambridge, Massachusetts, 29 May to 2 June 1989. The Workshop reviewed scientific results, planned co-operative analysis, established a global scientific context for the emerging Mediterranean ocean science and focussed on interdisciplinary scientific advances.

Phase I of POEM ends on 31 December 1990. Phase II is planned from 1991 through 1997, with three major field elements, which will include chemistry and biology.

235 **The Assembly noted** that internationally co-ordinated and co-operative combined modelling and observational studies of the dynamics in the Western Mediterranean and its connections to the Eastern Mediterranean can be very fruitful in producing an understanding of the circulation, which can serve as a basic input to the understanding and study of other subjects such as resources and marine contamination.

236 **The Assembly expressed** its satisfaction on the state of progress in the implementation of the study of Physical Oceanography of the Eastern Mediterranean and **decided** that IOC should continue to provide support for the implementation of POEM.

237 Several Delegates expressed the willingness of their countries to participate in POEM activities.

238 **The Assembly approved** the proposal to set up a project on the Western Mediterranean (PRIMO) under the joint co-operation of IOC and ICSEM and establish an ad hoc group of experts to further develop, promote and co-ordinate this project.

239 Several Delegates referred to the limited circulation of information to the IOC Member States on both programmes, especially at the present stage of their discussion and initial implementation, and the Secretariat promised to improve the circulation of information and to assist (to the extent resources made available permit) all interested IOC Member States in participating in the programmes.

240 In order to avoid in future the possible concern by Member States which are not in the areas of investigations of POEM and PRIMO, **the Assembly reaffirmed** the need to follow the rules of IOC regarding the freedom of all Member States to participate in the scientific programmes of IOC, regardless of their geographical position.

8. CO-OPERATION WITH OTHER ORGANIZATIONS OF THE UN SYSTEM AND OTHER BODIES

8.1 THE INTER-SECRETARIAT COMMITTEE ON SCIENTIFIC PROGRAMMES RELATING TO OCEANOGRAPHY (ICSPRO)

241 The Chairman introduced the subject and gave his appraisal of the Twenty-seventh Session of ICSPRO. He called particular attention to the fact that UNEP had sent an observer to the inter-secretariat Committee for the first time in 10 years and had made most positive proposals for strengthening co-operation with the IOC, including secondment of staff, should negotiations for joint projects move forward. The Chairman then referred to the budgetary constraints of Member Organizations that had obliged IMO, previously, and more recently FAO, to temporarily recall their seconded professional staff. Mention was also made of the interest of Member Organizations in continuing consultation on the formulation of programme and budget documents and in seeking ways by which the Committee could be more effective in carrying out its work. In response to a request from SCOR, suggestions for improvements in the organization of Joint Oceanographic Assemblies had been made.

242 Several Delegates expressed interest in the work of the Committee on Implications of Trends in the New Ocean Regime to the Work of Member Organizations and the IOC, especially in regard to paragraph 23 of the Summary Report of the Session. **The Assembly agreed** that the UN Convention on the Law of the Sea made adequate provision for vessels participating in agreed international programmes to take routine oceanographic observations.

243 **The Assembly requested** the Chairman to maintain close contact with IMO and FAO with a view to their renewing arrangements for seconded staff as soon as possible. **The Assembly expressed** its appreciation for the continued support of general service posts by Member Organizations and to WMO for a professional post and partial funding of a general service post, in support of all activities of interest for WMO and in particular IGOSS.

244 In referring to the ICSPRO Agreement, **the Assembly reiterated** the importance of the principle of collaboration for mutual benefit, upon which the agreement is based, and the role of IOC as a joint specialized mechanism in this regard.

245 **The Assembly took note** of the renewed participation of UNEP as an observer to ICSPRO and reiterated its interest in seeing UNEP become a full member of the inter-secretariat Committee.

8.1.1 SECOND PHASE OF THE LONG-TERM AND EXPANDED PROGRAMME OF OCEANIC EXPLORATION AND RESEARCH (LEPOR-II)

246 Recalling the responsibility of IOC, by General Assembly Resolution 2560 (XXIV), to keep LEPOR up to date and implement it in progressive stages, the Chairman informed the Assembly of steps taken to prepare a status report on Marine Research and Ocean Services: Opportunities for Progress, which was being discussed by ECOSOC at its present session. The text of the report, as found in Document IOC-XV/8 Annex 5, had been transmitted to ECOSOC following discussion at ICSPRO, under cover of a note from the Secretary General (Document IOC-XV/8 Annex 5 Add.).

247 The Representative of FAO, in supporting the updating of LEPOR as a framework of co-operation within the UN System, called attention to the desirability of using this vehicle as a means of assigning responsibilities and identifying priorities to be assumed by IOC and other agencies.

248 In expressing the view that developments in the study of climate change offers a particular challenge to IOC, the Representative of WMO expressed concurrence with the text being presented to ECOSOC.

249 **The Assembly agreed** that the updating of LEPOR offered an opportunity to IOC, and the UN System as a whole, to adjust goals at a time when world political opinion is focussed on the importance of environmental issues and the need to understand global change, of which the ocean is a major element. At the same time, **the Assembly acknowledged** the need for continued efforts on the part of Member States to ensure that the IOC is recognized as the intergovernmental mechanism for ocean science and services co-ordination and the source of advice and action on specific problems.

250 **The Assembly commended** the report and **encouraged** IOC Member States, members of ECOSOC, to support it and any associated decisions that ECOSOC might transmit to the General Assembly. In this regard, **the Assembly noted** that this reporting function offered IOC an opportunity to reach a wider audience of governmental representatives and that advantage of this possibility should be taken to increase awareness of the role and functions of the Commission. **The Assembly instructed** the Secretary, in further development of the document or any related text, to take into account the need to give greater emphasis to regional concerns, and related TEMA aspects, and the assignment of priorities and responsibilities for marine-related activities within the UN System.

8.1.2 STUDY OF LEGAL ASPECTS OF OCEAN DATA ACQUISITION SYSTEMS (ODAS)

251 The Chairman introduced the item, recalling the decisions on this topic by the Executive Council at its Twenty-first session viz, (i) that a documentary analysis of prior steps taken in the framework of the Legal Status of ODAS since the early 1970s be prepared, and to welcome the kind offer by USSR to undertake this

analysis, and (ii) to invite organizations members of ICSPRO to consider establishing a joint group of experts to carry out the preparatory work towards the drawing up of a draft international convention on the legal status of ODAS. The latter invitation was submitted to the Twenty-seventh Session of ICSPRO and received an in-principle agreement from IMO, the UN Office of Ocean Affairs of the Law of the Sea (OALOS) and WMO which, at the Fortieth Session of its Executive Council, had already agreed "to participate in the preparatory work for the proposed convention, to the extent of the technical competence existing within WMO".

252 Professor A. Kolodkin, from the Soviet Maritime Law Association, reported on the state of preparation of the documentary analysis, which takes into account the preliminary draft convention worked out in 1972; the comments received since that time from various Member States; the two sessions (held in 1974 and 1979) of the IOC Group of Experts on the Private Law Aspects of ODAS; and the UN Convention on the Law of the Sea signed in April 1982. Professor Kolodkin and his team carefully reviewed the 1972 preliminary draft in the light of the 1982 Convention, and took into account other international agreements. This documentary analysis will be presented in a tabular form and contain four elements : (i) the 1972 draft, together with civil and private law relevant articles; (ii) a proposed new drafting of these articles ; (iii) comments received from Member States; and (iv) reference to international legal documents used. It is expected that the document will be finalized by the end of 1989.

253 **The Assembly** unanimously **expressed** its gratitude for the considerable amount of work done by Professor Kolodkin and his team, **and extended** its warm thanks to the Soviet Union which allowed for this work to be carried out. It then discussed how to deal with the document, once finalized, and **agreed** on the following: (i) once completed, the document will be sent to the Secretary IOC; (ii) the Secretary, in his capacity of Secretary of ICSPRO, will call a meeting of ICSPRO Agencies and Professor Kolodkin, to review the document; (iii) this document, together with the views of the meeting, will be circulated to the National Contact Points of all co-operating Agencies (viz IOC, IMO, UN/OALOS and WMO) with a covering Circular Letter signed by the co-operating Agencies, with a request to those contact points to organize internal consultations and send their comments to the Secretary IOC; (iv) at the same time, the interested ICSPRO Agencies will be invited to nominate experts who could participate in further work as necessary.

254 **The Assembly requested** that further progress in this matter be reported to the forthcoming Twenty-third Session of the Executive Council. In this connection, **it requested** the Secretary to approach IMO and invite this Organization, in the meantime, to review the technical annexes of the 1972 preliminary draft convention.

8.2 CO-OPERATION WITH OTHER BODIES

255 The Chairman informed the Assembly of the granting of observer status to the IOC by the Baltic Marine Environment Protection Commission - Helsinki Commission (Document IOC-XV/8 Annex 9), and **the Assembly noted** its decision to grant the Baltic Marine Environment Protection Commission - Helsinki Commission observer status.

256 Speaking for the Marine Sciences Committee of the Pacific Science Association, Dr. V. Oussov informed the Assembly about the proposal from the Marine Sciences Committee to develop co-operation with IOC within the framework of the IOC regional programmes in the Pacific Ocean, including possible formal arrangements for such co-operation.

257 He also informed the Assembly of the plans of the Marine Sciences Committee to establish an international laboratory for marine biology, biotechnology and ecology and the intention to use such a laboratory for TEMA related activities, and he invited the Assembly to consider the possibility of IOC involvement.

258 Finally, Dr. Oussov informed the Assembly of the proposal of the Marine Sciences Committee to organize in 1990 in USSR an international forum of leading scientists for peaceful exploration and preservation of the Pacific Ocean.

9. MEDIUM-TERM PLAN, PROGRAMME AND BUDGET

9.1 MEDIUM-TERM PLAN (1990-95)

259 In introducing this item, the First Vice-Chairman, Dr. M. Murillo, first congratulated the Secretary for producing a most interesting and detailed paper (Document IOC-XIV/8 Annex 6) in which are set forth major trends and strategies for IOC programmes, within an historical and problematic perspective. He drew attention to the action taken by the Chairman and Secretary to transmit the views of IOC to the Director-General of Unesco, as adopted by the Twenty-first Session of the IOC Executive Council through Resolution EC-XXI.7, and to the three paragraphs on the Commission's programmes found in the Draft Unesco Third Medium-Term Plan (Draft 25 C/4) under Sub-programme II.2.4, 'The marine sciences for the rationale use of the marine environment and its resources'.

260 Many Delegates congratulated the Secretary on the work done in developing the conceptual framework and implementation strategy found in Document IOC-XV/8 Annex 6 and agreed with the general assessment made. Noting that detailed planning was not feasible unless the Commission had adequate and dependable resources to carry out its programme, several Delegates referred to the relevance of the work of the FURES ad hoc Study Group in this regard and to the need for adequate staffing of the IOC Secretariat.

261 **The Assembly agreed** that the document provided a useful tool for future programming and suggested that IOC subsidiary bodies, in particular Sub-Commissions and Regional Committees, should consider as major items on their agendas the application of this framework and strategy to their programmes, making any adjustments required to reflect specific regional interests, and accordingly develop their own Medium-Term Plans.

262 Announcement was made of plans to convene at the Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, 19-22 September 1989, with support from the Federal Republic of Germany, an IOC-Unesco seminar devoted to mobilizing funding for implementation of the Unesco-IOC Comprehensive Plan for a Major Assistance Programme.

263 **The Assembly strongly endorsed** the planned seminar, the results of which should serve as input to the Fifth Session of the IOC Committee on TEMA when it considers updating the strategy of the Comprehensive Plan.

264 **The Assembly recalled** that the Comprehensive Plan had been developed and adopted by IOC and Unesco in response to Resolution IV, Annex VI, of the Third United Nations Conference on the Law of the Sea, and that implementation of the Plan had suffered greatly from lack of staff required to mobilize extra-budgetary funding.

265 **The Assembly drew attention to** the urgent need to develop a plan of action for the Comprehensive Plan and mobilize large-scale extrabudgetary funding, taking into account national and regional priorities, with a view to narrowing the presently widening gap in marine science and related technology between industrialized and developing countries.

266 Numerous Delegates and Representatives provided information on present and planned activities that could contribute to the Comprehensive Plan, including the development of human resources through training courses and regional training centres. In taking note of this information, **the Assembly stressed** the value of advance planning

for such initiatives so as to lead to an optimal integration of training components into the IOC programmes. **The Assembly instructed** the Secretary to make a study of available information on training courses and proposed regional training centres for discussion at the Fifth Session of the Committee for TEMA.

267 In discussing the reflection of IOC programmes within the Draft 25 C/4, **the Assembly deemed** it necessary to recall certain basic concepts that had led the Commission, through Resolution EC-XXI.7, to formulate specific advice to Unesco, in accordance with Article 2(i) of its Statutes.

268 **The Assembly adopted Resolution XV-10.**

9.2 IOC PROGRAMME AND BUDGET FOR 1990-1991

269 The First Vice-Chairman, Dr. M. Murillo, introduced Document IOC-XV/8 Annex 7 as the basic reference for this Agenda Item, noting that Document IOC-XV/7 provided information on the present financial status of the Commission. He noted further that the discussion under the previous Agenda Item on the IOC Contribution to the Third Medium-Term Plan provided a perspective within which to examine the more detailed consideration of forecast programme implementation during the first biennium of the six-year period.

270 **The Assembly noted** that the guidance and plans formulated by the expert groups and subsidiary bodies were largely reflected in the proposed programme and budget **and extended** its appreciation to the Secretary for the content and presentation of the relevant documentation.

271 Several Delegates pointed to the need to ensure regular intervals between sessions of Regional Committees and, in particular, the need to provide for the Fourth Session of IOCARIBE in late 1991.

272 Several Delegates recalled that Member States need to carefully analyze budgetary matters in preparation for policy matters raised during the governing body sessions **and the Assembly urged** the Secretary to distribute related documentation at least two months in advance.

273 Reiterating the critical staffing shortage in the Secretariat, as reflected in Table 4 of Document IOC-XV/8 Annex 7, **the Assembly recognized** that this inevitably would continue to have a negative impact on programme implementation unless urgent corrective measures were taken. **The Assembly expressed** grave concern about the situation.

274 Some Delegates suggested that some assistance could be generated by requesting experts in Member States to assume some specific secretariat tasks, using rapid transmission methods for close liaison with headquarters.

275 Some Delegates requested clarification on the distribution of funds in the regional components. **The Assembly took note** that these were meant as guidance as to the support available.

276 In response to a question, the Secretary informed the Assembly of the proposed distribution of new posts in the Science Sector of Unesco, and explained that the previously frozen posts had been formally abolished.

277 **The Assembly expressed** its deep appreciation to the following Member States who provide staff to the IOC, through contributions to the IOC Trust Fund, direct secondment and funding of associate expert posts: Belgium, China, Denmark, France, Germany (Federal Republic of), Japan, Sweden, USSR and the USA.

278 While fully appreciating the efforts of Member States to assist by seconding staff to IOC, **the Assembly drew attention** to the precarious situation of the Commission should such support diminish, given the abolition of posts assigned by Unesco to IOC in recent years.

279 Having noted the numerous offers made by Member States to host meetings, scientific conferences, and training courses, as well as requests for assistance to facilitate participation in the IOC Programmes, **the Assembly instructed** the Secretary to take these into account in decisions related to programme implementation.

280 **The Assembly identified** the need to reinforce the TEMA programme and related activities **and urged** Member States to provide additional support to TEMA.

281 **The Assembly recognized** that new and additional sources of funding were essential to fulfilling the role of the Commission **and requested** the FURES ad hoc Study Group to continue its work in this respect, especially in regard to future institutional arrangements, including the possibility of a pledging system.

282 **The Assembly adopted Resolution XV-11.**

9.3 PROGRAMME AND BUDGET OF THE UNESCO DIVISION OF MARINE SCIENCES (1990-1991)

283 In introducing this Agenda Item, and referring to Document MARINF/65, Dr. D.C. Krause, Director of the Unesco Division of Marine Sciences outlined the strategy, history and achievements of the Division since 1972 when a decision had been made to separate the Division and the IOC Secretariat. The programme is highly decentralized, being jointly planned and executed with Unesco's Regional Offices of Science and Technology. The programme is based on a scientific approach concerning co-operation with mainly the developing countries on the one hand, through development of human resources, infrastructure and research programmes, and with the international scientific community, on the other hand. The strategy has been successful, as measured by the large increase in the marine science capability in developing countries, and implementation of the COMAR coastal marine programme in some regions. The evolving challenges facing the community in the coming years have been outlined in the Division's study: *Year 2000 Challenges for Marine Science Training and Education Worldwide* (Unesco Reports in Marine Science 52).

284 The majority of Delegates who spoke supported the programme, concurring with its science-based strategy, and noted that it had produced significant results, especially in developing countries. Some described their joint projects with the Division, which were of excellent benefit to them. Many Delegates particularly drew attention to their useful co-operation in the coastal marine COMAR programme, especially in the COMARAF project (the African COMAR project). Several Delegates emphasized the value of the training received. One Delegate stated that more long-term fellowships are needed in Africa. Another offered co-operation for training courses in Conakry (1990) and Kiev (1991).

285 However, with respect to Latin America and the Caribbean, some Delegates indicated that COMAR has not had the same impact and its results have not matched its aspirations. It was affirmed that there should be better co-ordination of efforts in this sense. Two examples provided were the COMAR project on coastal systems and that on coastal dynamics of IOCARIBE, both of which have points in common that should be co-ordinated in order to better utilize available resources.

286 **The Assembly noted** that the current contraction of resources for science in many Third World countries is rapidly reversing the previous development of marine science in those countries and that this new reality will require a review of present strategies relative to this matter.

287 A number of Delegates stated that the Unesco Report in Marine Science 52 would find extensive use in their countries. One Delegate emphasized the importance of other areas of the programme such as taxonomy, reference collections, manuals, work on corals, mangroves, phytoplankton, etc.

288 Numerous Delegates emphasized the importance of co-operation between the Division of Marine Sciences and IOC, both of which would mutually benefit from closer collaboration, in view of the complementary nature of their programmes. Some suggested that better co-ordination might be achieved through structural adjustments, while others were satisfied with present arrangements. One of the latter indicated that the publication and communication expertise existing in the Division could be of great use in providing a better awareness of the Commission's programmes in Member States.

289 Some Delegations considered that the very late arrival of the report (MARINF/65) for this Agenda Item had hampered the discussion because they had not had time to consider it sufficiently.

290 In his concluding statement, the Director of the Division of Marine Sciences emphasized the value of co-operation, citing some examples. He also pointed out that the achievements of the Division were attained through the Unesco staff, at headquarters and in the field, working as a team, as well as through the numerous scientific teams in the countries.

291 Taking note of his retirement at the end of 1989, **the Assembly expressed** its sincere thanks to the Director of the Division of Marine Sciences for his dedication and co-operation.

10. ENHANCING THE ROLE OF THE COMMISSION

292 The First Vice-Chairman, Dr. M. Murillo, introduced the Summary Report of the First Session of the ad hoc Study Group on Measures to Ensure Adequate and Dependable Resources for the Commission's Programme of Work (Document IOC/FURES-I/3), explaining in some detail the conclusions reached and the methodology applied by the Group. He drew attention to the tasks which, in the view of the Members, had been completed, and those suggested for further study.

293 In referring to relevant action taken by the Twenty-second Session of the Executive Council, he informed the Assembly that the Council had adopted the revised Guidelines for the Preparation and Consideration of Draft Resolutions as found in Document IOC/EC-XXII/3 Annex IV. The Council had also referred two additional subjects to the ad hoc Study Group for consideration at informal meetings during the present Assembly: (i) date and place of the Twenty-third Session of the Executive Council and (ii) formation of the Resolutions Committee at IOC-XV.

294 Several Delegates endorsed the conclusions of the ad hoc Study Group and noted the need to consider separately the work of the Commission from an internal perspective, related to programme management, and from the perspective of external relationships between the IOC and other bodies, taking into account the role and functions of the Commission. Various views were expressed as to the advantages of a long-term (10-year rolling plan) forecast of programme implementation, bearing in mind the expansion in the number of IOC Programmes in recent years and the expectation that this pattern would continue. Some Delegates noted the need to match IOC planning with the Unesco planning and implementation time-frames.

295 Noting that negotiations were still in progress between the Secretary IOC and the Unesco Division of Conferences, Languages and Documents regarding IOC documentation needs, **the Assembly expressed** appreciation for the efforts of the Secretary to produce shorter reports, while recognizing that adherence to the present standards set by Unesco is not feasible.

296 **The Assembly agreed** that the identification of new sources of funding for the Commission was a high priority in order to support staff and finance project implementation. **The Assembly urged** the ad hoc Study Group to continue its examination of this subject and include consideration of institutional arrangements and a possible pledging system.

297 **The Assembly decided** to change the name of the Resolutions Committee to that of the Technical Review Committee for Resolutions and **instructed** the Secretary to amend Section 9.1 of the IOC Manual in accordance with the revised text found in Annex VIII.

298 Following the completion of the elections (Agenda Item 11), some Delegates raised the question of geographical distribution referring to Article 5, paragraph 4 of the Statutes and asked for clarification as to the implications of the statement in the said Article.

299 **The Assembly recognized** that this matter needs careful study and concerns interpretation of the Statutes. **The Assembly decided** that the subject be studied in its widest context by the ad hoc Study Group, which should report on the matter to the Sixteenth Session of the Assembly.

300 Stressing that the First Vice-Chairman should be able to draw upon any expertise deemed necessary to carry out the tasks assigned, **the Assembly decided** to maintain the present core composition of the ad hoc Study Group.

301 **The Assembly accepted** the Summary Report of the First Session of the ad hoc Study Group and **expressed** its appreciation for the progress made on modalities of participation of Member States and implications of functional autonomy (Annex VI). With regard to the amendments to the IOC Rules of Procedure proposed in the Summary Report, **the Assembly instructed** the Secretary to:

(i) transmit to Member States (IOC Action Addressees) for their comment, the relevant proposals found in paragraphs 72-75 of Document IOC/FURES-I/3;
(ii) set a deadline of 15 October 1989 for receipt of comment so that the ad hoc Study Group can give due consideration to this matter at its Second Session, forecast for mid-November 1989; and,
(iii) inform Member States that an appropriate item will be included in the Agenda of the Sixteenth Session of the IOC Assembly for decision.

302 **The Assembly requested** the ad hoc Study Group to report to the Twenty-third Session of the Executive Council and subsequently to the Assembly.

303 **The Assembly adopted** Resolution XV-12.

11. ELECTIONS

304 In order to ensure that Rule of Procedure 18, paragraph 1, reflects the revised IOC Statutes (Article 5, paragraph 4(b)), regarding the number of seats on the Executive Council, **the Assembly adopted** Resolution XV-13, in accordance with Rule of Procedure 57.

11.1 ELECTION OF THE OFFICERS OF THE COMMISSION

305 **The Assembly noted** the report of the Chairman of the Nominations Committee, Professor C. Druet, informing the Assembly that all nominations received for election had been found valid. The Chairman further informed the Assembly that there was only one candidate for each post as Chairman, First, Second and Third - Vice-Chairman. These were elected by acclamation. There were two candidatures for the

position of Fourth Vice-Chairman and therefore a vote was organized to elect the Fourth Vice-Chairman.

306 The newly elected Officers of the Commission are:

Chairman	:	Prof. Ulf Lie (Norway)
First Vice-Chairman	:	Dr. Manuel Murillo (Costa Rica)
Second Vice-Chairman	:	Prof. Alexander Yankov (Bulgaria)
Third Vice-Chairman	:	Mr. El-Hafid Tabet-Aoul (Algeria)
Fourth Vice-Chairman	:	Dr. G.S. Quraishee (Pakistan).

11.2 ELECTION OF THE MEMBERS OF THE EXECUTIVE COUNCIL

307 **The Assembly noted** that 31 candidatures were found in order to fill 29 seats on the Executive Council. A vote was therefore organized to elect the members of the Executive Council, in accordance with Rule of Procedure 47.

308 The Member States sitting on the Executive Council as a result of the elections, as well as the list of Member States of the Commission, are given in Annex IV hereto.

12. DATES AND PLACES OF THE SIXTEENTH SESSION OF THE ASSEMBLY, AND THE TWENTY-THIRD AND TWENTY-FOURTH SESSIONS OF THE EXECUTIVE COUNCIL

309 Following the proposal from the Secretariat presented by the Chairman, **the Assembly agreed** that its Sixteenth Session should be held in Paris starting 6 March 1991, ending no later than 22 March 1991, the exact length to be determined on the basis of the Agenda. The Twenty-fourth Session of the Executive Council, acting as the Steering Committee for the Assembly, should be held on 5 March 1991.

310 Following the proposal of the Twenty-second Session of the Executive Council and the considerations, during the present session, of the Summary Report of the First Session of the ad hoc Study Group on Measures to Ensure Adequate and Dependable Resources for the Commission's Programme of Work, **the Assembly concluded** that the Twenty-third Session of the Executive Council should start on 6 March 1990 and close not later than 15 March 1990, the exact length of the Session depending upon the requirements of the Agenda.

13. ADOPTION OF THE SUMMARY REPORT

311 The Chairman of the Resolutions Committee, Professor A. Yankov, informed the Assembly that all Draft Resolutions had been seen by the Committee and found to conform with the Guidelines.

312 Having considered the Draft Summary Report, **the Assembly adopted** it unanimously together with thirteen Resolutions.

14. CLOSURE

313 The Chairman thanked the Delegations and other participants for their very constructive and hard work during the Assembly and the co-operative spirit which had led to consensus in all cases. He also thanked the Rapporteur and the Secretariat, the interpreters and other services who had all helped the Assembly to function very smoothly. He expressed his appreciation to the Secretariat and especially the documentalist for producing the Report in good time.

314 The Delegate of United States, seconded by the Delegate of France, paid tribute to the Chairman's way of handling the session, on behalf of all the Delegates.

315 The Chairman closed the Session at 13'00 hours on 19 July 1989.

ANNEX I

AGENDA

1. **OPENING**

2. **BRUUN MEMORIAL LECTURES**

3. **ADMINISTRATIVE ARRANGEMENTS**

   3.1 ADOPTION OF THE AGENDA
   3.2 DESIGNATION OF THE RAPPORTEUR
   3.3 CONDUCT OF THE SESSION, TIMETABLE AND DOCUMENTATION

4. **REPORT ON THE ACTIVITIES OF THE COMMISSION**

   4.1 SECRETARY'S REPORT ON INTERSESSIONAL ACTIVITIES
   4.2 ADOPTION OF THE BIENNIAL REPORT FOR 1987-1988

5. **OCEAN SCIENCES**

   5.1 OCEAN DYNAMICS AND CLIMATE (ODC)
      5.1.1 Ocean Processes and Climate
      5.1.2 Oceanographic Components of the WCRP
         5.1.2.1 Study of Tropical Oceans and Global Atmosphere (TOGA)
         5.1.2.2 World Ocean Circulation Experiment (WOCE)
      5.1.3 Ocean Dynamics and Circulation on the Continental Shelf
      5.1.4 Future Requirements for an Integrated Global Ocean Monitoring System as a Basis for a World Ocean Watch

   5.2 OCEAN SCIENCE IN RELATION TO NON-LIVING RESOURCES (OSNLR)
      5.2.1 IOC-UN Guiding Group of Experts on OSNLR
      5.2.2 CCOP-IOC Studies of East Asian Tectonics and Resources (SEATAR)
      5.2.3 CCOP(SOPAC)-IOC Studies of South Pacific Tectonics and Resources (STAR)

   5.3 OCEAN MAPPING

   5.4 MARINE POLLUTION RESEARCH AND MONITORING AND RELATED PROGRAMMES
      5.4.1 Global Investigation of Pollution in the Marine Environment (GIPME) and the Marine Pollution Monitoring System (MARPOLMON)
      5.4.2 Joint Global Ocean Flux Study (JGOFS)
      5.4.3 Environmental Impact Studies

   5.5 THE ICSU INTERNATIONAL GEOSPHERE-BIOSPHERE PROGRAMME (IGBP)
   5.6 OCEAN SCIENCE IN RELATION TO LIVING RESOURCES (OSLR)

6. **OCEAN SERVICES**

   6.1 INTEGRATED GLOBAL OCEAN SERVICES SYSTEM (IGOSS)

   6.2 OCEAN OBSERVING SYSTEMS
      6.2.1 Global Sea-Level Observing System (GLOSS)
      6.2.2 Drifting-Buoy Co-operation Panel (DBCP)

6.3 INTERNATIONAL OCEANOGRAPHIC DATA AND INFORMATION EXCHANGE (IODE)

6.3.1 Data Exchange
6.3.2 Marine Information Management

7. **REGIONAL SUBSIDIARY BODIES AND CO-OPERATION**

7.1 REGIONAL COMMITTEE FOR THE CENTRAL INDIAN OCEAN (IOCINDIO)
7.2 PROPOSAL FOR THE ESTABLISHMENT OF A SUB-COMMISSION FOR THE WESTERN PACIFIC (WESTPAC)
7.3 JOINT IOC-WMO-CPPS WORKING GROUP ON THE INVESTIGATIONS OF EL NINO
7.4 MEDITERRANEAN

8. **CO-OPERATION WITH OTHER ORGANIZATIONS OF THE UN SYSTEM AND OTHER BODIES**

8.1 THE INTER-SECRETARIAT COMMITTEE ON SCIENTIFIC PROGRAMMES RELATING TO OCEANOGRAPHY (ICSPRO)
8.1.1 Second Phase of the Long-term and Expanded Programme of Oceanic Exploration and Research (LEPOR-II)
8.1.2 Study of Legal Aspects of Ocean Data Acquisition System (ODAS)

8.2 CO-OPERATION WITH OTHER BODIES

9. **MEDIUM-TERM PLAN, PROGRAMME AND BUDGET**

9.1 MEDIUM-TERM PLAN (1990-95)
9.2 IOC PROGRAMME AND BUDGET FOR 1990-1991
9.3 PROGRAMME AND BUDGET OF THE UNESCO DIVISION OF MARINE SCIENCES (1990-1991)

10. **ENHANCING THE ROLE OF THE COMMISSION**

11. **ELECTIONS**

11.1 ELECTION OF THE OFFICERS OF THE COMMISSION
11.2 ELECTION OF THE MEMBERS OF THE EXECUTIVE COUNCIL

12. **DATES AND PLACES OF THE SIXTEENTH SESSION OF THE ASSEMBLY, AND THE TWENTY-THIRD AND TWENTY-FOURTH SESSIONS OF THE EXECUTIVE COUNCIL**

13. **ADOPTION OF THE SUMMARY REPORT**

14. **CLOSURE**

ANNEX II

ADOPTED RESOLUTIONS

Resolution Number	Agenda Item	Title
XV-1	5.1.2.1	Second Session of the WMO-IOC Intergovernmental TOGA Board
XV-2	5.1.2.2	Institutional Arrangements for WOCE
XV-3	5.1.3	Ocean Dynamics and Circulation on the Continental Shelf
XV-4	5.1.4	Global Integrated Ocean Observing System Development
XV-5	5.4.1	IOC-UNEP Co-sponsorship of the GIPME Programme
XV-6	5.5	IOC Involvement in the International Geosphere-Biosphere Programme (IGBP)
XV-7	6.1	Fifth Session of the Joint IOC-WMO Working Committee for the Integrated Global Ocean Services System (IGOSS)
XV-8	6.2.1	Global Sea-Level Observing System (GLOSS)
XV-9	7.2	Establishment of an IOC Sub-Commission for the Western Pacific (WESTPAC)
XV-10	9.1	IOC Contribution to the Third Unesco Medium-Term Plan
XV-11	9.2	Proposal on the IOC Programme of Work and Budget for 1990-91
XV-12	10	Ad hoc Study Group on Measures to Ensure Adequate and Dependable Resources for the Commission's Programme of Work
XV-13	11	Membership of the Executive Council

Resolution XV-1

SECOND SESSION OF THE WMO-IOC INTERGOVERNMENTAL TOGA BOARD

The Intergovernmental Oceanographic Commission,

Having considered the Summary Report of the Second Session of the WMO-IOC Intergovernmental TOGA Board (Geneva, 5-9 December 1988),

Noting Recommendation TC-OPC-III.2 of the Third Session of the Technical Committee on Ocean Processes and Climate,

Accepts the Summary Report of the Second Session of the WMO-IOC Intergovernmental TOGA Board;

Endorses the concept of the TOGA Coupled Ocean-Atmosphere Response Experiment (TOGA COARE) as an integral part of the TOGA programme;

Decides to support planning of TOGA COARE through the SCOR-IOC CCCO and TOGA SSG;

Also decides to provide support for, and interact as needed with, the International TOGA Scientific Conference to be convened jointly by WMO, ICSU, SCOR and IOC in Honolulu, USA, 16-20 July 1990;

Invites Member States to encourage and support participation of oceanographers who are active in TOGA in the above Conference;

Invites the Third Joint IOC-WMO Meeting for the Implementation of IGOSS XBT Ship-of-Opportunity Programme (Hamburg, 16-20 October 1989) to consider and recommend further actions needed to achieve TOGA goals in the Indian and Atlantic oceans;

Invites the Group of Experts on GLOSS to consider and advise on actions to implement the planned TOGA sea-level observing requirements, particularly in the Atlantic Ocean.

Resolution XV-2

INSTITUTIONAL ARRANGEMENTS FOR WOCE

The Intergovernmental Oceanographic Commission,

Recalling Resolution XIV-2 and Resolution EC-XXI.1,

Having considered the proposals made by the Chairman of the Commission and the President of SCOR, based on recommendations of the Chairmen of CCCO, the WOCE SSG and the TC/OPC and the results of the discussions on this matter at the International WOCE Scientific Conference, Paris, 28 November-2 December 1988,

Noting with satisfaction the progress in the planning of the World Ocean Circulation Experiment which is scheduled to start in 1990,

Noting Recommendation TC-OPC-III.1 of the Third Session of the Technical Committee on Ocean Processes and Climate,

Recognizing that the WOCE International Project Office (WOCE-IPO) provides staff support for the WOCE SSG, with communication links to the IOC Secretariat and the CCCO Secretariat,

A - Intergovernmental WOCE Panel

Approves the establishment of an Intergovernmental WOCE Panel (IWP) as a subsidiary body of the IOC Technical Committee on Ocean Processes and Climate, with specific responsibilities for intergovernmental WOCE matters;

Invites WMO to co-sponsor, with the IOC, the Intergovernmental WOCE Panel;

Approves, subject to concurrence by WMO, the Terms of Reference and composition of the Panel as shown in the Annex to this Resolution;

Invites Member States that have indicated their on-going involvement or intention to participate in the implementation of WOCE through a letter to the Secretary to nominate their representatives to the Panel, if necessary in consultation with their Permanent Representatives of WMO Member States;

Requests the Scientific Steering Group for WOCE, the SCOR-IOC CCCO and the WMO-ICSU JSC to provide scientific guidance to the Intergovernmental WOCE Panel for the conduct of WOCE, including the requirements for ocean observing and data management systems needed to achieve the scientific objectives of WOCE;

Instructs the Secretary to convene the First Session of the Intergovernmental WOCE Panel in Paris in November 1990.

B - WOCE International Project Office

Authorizes the Secretary IOC to develop formal working arrangements with the WOCE International Project Office for joint activities in support of WOCE.

Annex to Resolution XV-2

TERMS OF REFERENCE AND COMPOSITION OF THE INTERGOVERNMENTAL WOCE PANEL (IWP)

1. **FUNCTIONS**

The Intergovernmental WOCE (World Ocean Circulation Experiment) Panel (IWP) is established as a subsidiary body of the Technical Committee on Ocean Processes and Climate in order to meet the scientific, managerial, implementational, and resource needs of WOCE as defined by the Scientific Steering Group (SSG). The IWP will carry out the following functions:

1.1 To provide advice and recommendations to the WOCE SSG on intergovernmental matters related to the implementation of WOCE and achievement of its goals, on the basis of briefings and requests by the SSG.

1.2 To review requirements as identified by the SSG for efficient and cost-effective implementation of the WOCE Implementation Plan requiring intergovernmental functions and formulate recommendations accordingly.

1.3 To address means of providing, on the basis of defined requirements, those resources required to meet WOCE needs.

1.4 To ensure, through an appropriate mechanism, interaction and co-ordination with IOC and WMO programmes and committees relevant to the implementation of WOCE, including WCRP, IGOSS, DBCP, IODE, TEMA, GIPME, GLOSS, WWW, VOS, and CMM.

1.5 To monitor the activities of the relevant IOC and WMO operational programmes and to advise the SSG to what extent these are able to meet WOCE needs and on possible specific supplementary requirements for WOCE to be addressed to these bodies and programmes.

1.6 To interact with the WOCE SSG, the SCOR-IOC CCCO and the WMO-ICSU JSC concerning scientific matters related to the implementation of WOCE and the state of progress in the implementation.

1.7 To report to the Assembly and the Executive Council of IOC on these matters through the TC/OPC and to the Executive Council of WMO.

2. SCIENTIFIC AND TECHNICAL ADVICE

2.1 In discharging its tasks, the Panel will be guided by the overall scientific objectives and research strategy formulated by the WOCE SSG and the SCOR-IOC Committee on Climatic Changes and the Ocean.

2.2 The Panel will also be guided by the emerging overall intergovernmental operational strategy being formulated by the IOC Technical Committee on Ocean Processes and Climate and by the relevant WMO bodies.

3. COMPOSITION

3.1 The membership of the IWP is comprised of those Member States of IOC and of WMO that have declared through a letter to the Secretary IOC or the Secretary-General WMO their on-going involvement or intention to participate in the implementation of WOCE, including those committed to participation in WOCE, whether on a global scale or on regional aspects of WOCE implementation.

3.2 The Chairmen or designated representatives of the SCOR-IOC CCCO, the WMO-ICSU JSC, WOCE SSG and TC/OPC will participate, ex officio, in the Panel.

4. ORGANIZATION OF SESSIONS

4.1 The IWP shall hold sessions at the dates and places which will be recommended by the Panel and arranged by the Secretary IOC in consultation with the Secretary-General WMO and the Chairman TC/OPC. Sessions shall normally be held every 18 months. Invitations to attend the sessions shall be sent to:

(i) Member States of the Panel.
(ii) The SCOR-IOC CCCO, the WMO-ICSU JSC, WOCE SSG and TC/OPC.
(iii) Other intergovernmental and non-governmental organizations interested in WOCE.
(iv) Other experts as determined by the Panel.

4.2 Prior to the closure of each session, the Panel will elect from its members a Chairman who will serve in that capacity until the closure of the next session.

4.3 The sessions shall, in principle, be arranged without financial costs to IOC and WMO, except for secretariat support, and travel and per diem support for invited experts which will be shared by WMO and IOC. Sessions will be conducted, documentation will be provided, and the report of each session will be prepared in one language, unless otherwise specifically requested.

4.4 Secretariat support for the Panel will be provided by the Secretary IOC with assistance of the CCCO Secretary.

Resolution XV-3

OCEAN DYNAMICS AND CIRCULATION ON THE CONTINENTAL SHELF

The Intergovernmental Oceanographic Commission,

Having considered the proposal on "An International Programme for the Dynamics and Oceanography of Coastal and Shelf Seas and Exchanges: Rationale and Elements" (Document IOC/INF-769 and Corrigendum) prepared, on the initiative of the Commission, by an ad hoc Group of Experts.

Having received a recommendation from the Technical Committee on Ocean Processes and Climate that the IOC Assembly endorse such a programme,

Noting the importance of establishing such a programme and its great potential value for coastal zone management, exploration and exploitation of living and non-living resources in the coastal zone and shelf seas as well as for the programmes dealing with the global study of ocean and climate, such as GIPME, WOCE, JGOFS,

Decides to establish an ad hoc Group of Experts:

(i) to assist in the organization of a Workshop on Ocean Dynamics and Circulation on the Continental Shelf so as to provide:

  (a) a comprehensive review on a worldwide basis of the state of knowledge of coastal seas in the major regions;
  (b) a comprehensive review of the state of knowledge of the dynamics of basic relevant processes;
  (c) a review and assessment of existing methodologies;
  (d) an evaluation of existing capabilities, needs and opportunities for training; infrastructure development; transfer of technologies and methodologies; and

(ii) to follow-up the recommendations of the workshop by preparing strategies and a draft programme plan, for presentation to the Sixteenth Session of the IOC Assembly;

Instructs the Secretary to:

(i) organize the Workshop in 1990 or in the first quarter of 1991.
(ii) involve the widest possible participation of scientists from developing and developed countries;
(iii) assure effective interaction with relevant programmes of Unesco, FAO and WMO, as well as with the Scientific Advisory Bodies of the Commission;
(iv) support the implementation of IOC regional projects in coastal oceanography already initiated or proposed by IOC regional bodies.

Resolution XV-4

GLOBAL INTEGRATED OCEAN OBSERVING SYSTEM DEVELOPMENT

The Intergovernmental Oceanographic Commission,

Noting:

(i) the revised Statutes of the IOC by which the Commission is entrusted to promote, plan and co-ordinate ocean observing and monitoring systems,

(ii) the proposals of the Twenty-first Session of the IOC Executive Council regarding the accelerated progressive development of the next generation global operational ocean observing system and related ocean services,

(iii) Resolution 11 (EC-XLI) from the WMO Executive Council on the development of a global operational ocean observing system,

(iv) the proposals of the Second Session of the WMO-IOC Intergovernmental TOGA Board to initiate planning for the implementation of such a system,

(v) the preparation of long-term plans for some operational elements of such a system, including IGOSS, GLOSS, and IODE,

(vi) the preparation of implementation plans and initiation of scientific programmes, including TOGA, WOCE, JGOFS and possible emerging global geoscience programmes, that will provide information for development of such a system,

(vii) the proposed re-establishment by CCCO and JSC of an Ocean Observing System Development Panel (OOSDP), and

Being concerned about the possible termination of the North Atlantic Ocean Weather Stations at the end of 1989,

Recognizing:

(i) the necessity of systematic global ocean observations for understanding, monitoring, and predicting the state of and changes in the physical and chemical ocean environment and large-scale biological systems and related processes involved in climate change, and large-scale ocean-atmosphere interactions,

(ii) that an adequate ocean observing system must resolve the energy containing structures in the ocean, and that existing observing systems are insufficient for such resolution in space and time,

(iii) that the emerging developments of new technology will make it possible to enhance the scope of a global integrated ocean observing system, and

(iv) that new commitments from governments will be required to implement a global ocean observing system, and that the internationally recognized importance of monitoring and predicting change in the global environment provides the justification for developing such commitments,

Decides that there is an urgent need to substantially modernize and expand the existing global ocean observing systems through: (i) accelerated deployment of existing observation systems and (ii) phased integration of new technology, satellite and in situ. Criteria for this new generation system are provided in the Annex to this Resolution;

Reaffirms that the Intergovernmental Oceanographic Commission is the appropriate intergovernmental organization for the promotion, planning and co-ordination of a global integrated ocean observing system;

Urges Member States to strengthen the IOC Secretariat in order to assist in developing, implementing, and maintaining the global integrated ocean observing system and to develop the necessary training and assistance activities to support the operational measurements, including a remote-sensing training programme, through appropriate mechanisms;

Instructs the Secretary to invite the Secretary-General of WMO and Executive Heads of other appropriate UN Organizations to co-operate, within their respective fields of

competence, in the development of complementary and compatible components of an observing system for ocean and atmosphere, particularly in connection with requirements of global climate studies and assessment;

Instructs the Secretary, in consultation with the Secretary-General of WMO, and with the advice of the TC/OPC and the CCCO, to develop a statement on the importance of the ocean in global environmental change and the consequent need to expand and modernize the global integrated ocean observing system as part of a global system for monitoring and predicting environmental change;

Requests the Chairman IOC to present this statement to the United Nations, the IPCC and interested UN specialized agencies to ensure that development of ocean components of global observing systems be taken into account in planning by these bodies to address the issue of climate change;

Establishes an IOC ad hoc Group of Experts to work with and support the proposed Ocean Observing System Development Panel of the CCCO-JSC to develop a plan for the system. The plan will include requirements, techniques, and an initial implementation strategy. A progress report should be presented to the Twenty-third Session of the IOC Executive Council and transmitted for information to the Forty-second Session of the WMO Executive Council, in 1990, with an elaborated report to be presented to the Fourth Session of the TC/OPC. The report should also be transmitted to the governing bodies of co-operating UN organizations;

Invites Member States to consider ways and means by which they can assist in the continuation of long-term ocean measurements which have been and are being collected from Ocean Weather Ships, since these time series are among the longest and most useful of oceanographic data series; and

Instructs the Secretary to undertake actions to strengthen IOC activities in the application of satellite remotely-sensed data for study of the marine environment. These include facilitating access of scientists and national organizations to remotely-sensed oceanographic data, establishing liaison with satellite operational agencies, and organizing training programmes for graduate oceanographers.

Annex to Resolution XV-4

CRITERIA AND APPROACH FOR THE DEVELOPMENT OF A GLOBAL INTEGRATED OCEAN OBSERVING SYSTEM

1. A statement should emphasize the importance of the ocean in global environmental change and the consequent need to expand and modernize the global integrated ocean observing system for monitoring and predicting environmental change. This statement will be presented to the United Nations, IPCC and UN specialized agencies to ensure that development of a global integrated ocean observing system be taken into account in planning by these bodies to address the issue of climate change.

2. Such a statement will include a short review of the present state and achievements of existing ocean observing systems which, despite their limitations, have already permitted identification of some significant variations and trends in global climate and are already providing information to decision makers responsible for formulating policies designed to respond to the ecological and socio-economic effects of future climate change.

It should clearly state that immediate action can be taken in implementing on-going systematic observations of a number of key elements of the ocean of high priority in monitoring and predicting global change using techniques available today. These immediate elements should include the following specific observations with annual or more frequent sampling resolution when appropriate:

- Global sea level;
- Global distribution of sea-surface temperature;
- Global distribution of upper ocean temperature;
- Sea ice concentration;
- Heat carried by ocean currents, initially in the Atlantic;
- Structure of major elements of the ocean circulation;
- Statistics of the transient motions in the ocean;
- Global distribution of ocean heat content;
- Sea-surface meteorological variables (temperature, pressure, wind).

The statement should also draw attention to the need to continue work on developing methods to monitor elements of the chemical ocean environment, large-scale biological systems and those elements of the ocean system - for example ocean-atmosphere fluxes and upper ocean salinity - which cannot be adequately measured and yet which are crucial for the prediction of global change.

3. A detailed plan for the next generation of a Global Integrated Ocean Observing System must be developed under IOC as a matter of urgency. The plan must take into account:

- completed or on-going studies in this field;
- the existing operational systems of IOC and WMO which include elements such as IGOSS, GLOSS, IODE and WWW;
- the known requirements for climate monitoring research-forecasting, as well as other operational applications.

4. The plan will form the basis for the formulation of IOC strategy for the progressive development of such a system.

5. The plan will be defined by the proposed CCCO-JSC OOSDP with the assistance of an ad hoc Group of Experts designated by the Secretary IOC in consultation with the Secretary-General of WMO and based on recommendations of the Chairman TC/OPC. The experts will be designated on the basis of their expertise and knowledge of elements of the present observing systems, bearing in mind different levels of national and institutional capabilities.

Resolution XV-5

IOC-UNEP CO-SPONSORSHIP OF THE GIPME PROGRAMME

The Intergovernmental Oceanographic Commission,

Recalling Resolution XII-20 on co-operation between IOC and UNEP in Marine Pollution Research and Monitoring, and Resolution XII-21 on the relationship between the IOC and UNEP, and in particular the Memorandum of Understanding on Co-operation between the United Nations Environment Programme and the Intergovernmental Oceanographic Commission of Unesco,

Recalling further Resolution XIV-15 which invites UNEP to co-sponsor the GIPME Programme and the Marine Pollution Monitoring System (MARPOLMON),

Noting Recommendation 4 of the Sixth Session of the Scientific Committee for GIPME concerning closer co-operation between IOC and UNEP in this field,

Noting further the existing co-sponsorship by IOC and UNEP of GIPME's Groups of Experts (GEMSI, GEEP and GESREM),

Welcomes the proposal that IOC and UNEP formally agree to co-sponsor the GIPME Programme;

Welcomes further the offer of the USSR to host the Second International "Integrated Global Ocean Monitoring" Symposium in the first part of 1991 and **invites** other relevant international organizations to co-sponsor this Symposium with IOC;

Endorses in principle the establishment of a joint IOC-UNEP Intergovernmental Panel that would co-ordinate the work of GIPME and other programmes within the two organizations in marine pollution;

Instructs the Secretary, together with Officers of the GIPME Programme, to prepare with the Secretariat of UNEP a proposal for the establishment of the Joint IOC-UNEP Intergovernmental Panel, including proposed Terms of Reference; and

Further instructs the Secretary to report on progress to the Twenty-third Session of the IOC Executive Council.

Resolution XV-6

IOC INVOLVEMENT IN THE INTERNATIONAL
GEOSPHERE-BIOSPHERE PROGRAMME (IGBP)

The Intergovernmental Oceanographic Commission,

Recognizing the key role of the ocean in geosphere and biosphere processes, as well as in global change,

Having noted that the Special Committee for the IGBP (SC-IGBP) (in its "Plan for Action"; Report N° 4, August 1988) and its Scientific Advisory Council have identified the study of ocean processes as a major focus for the IGBP,

Having also noted the description of a new programme on Global Change of the Past which was provided to the IOC by the CMG and summarized in Document IOC/INF-771,

Noting with satisfaction that the IOC and ICSU have held detailed discussions related to some IGBP elements of mutual interest, specifically between (i) IOC/GIPME and SCOR/JGOFS (a Core Programme in IGBP), and (ii) the ICSU/WMO JSC for WCRP, SCOR and IGBP, (through the CCCO), in relation to the oceanic components of the climate experiments of TOGA and WOCE,

Instructs the Secretary to broaden the IOC's interaction with ICSU and specifically to inform ICSU that the IOC is prepared to contribute to the IGBP and related climate change activities through a broad range of IOC programmes (listed in the Annex to this Resolution);

Further instructs the Secretary to develop this Annex into an IOC information paper and subsequently a publicity brochure, summarizing IOC interests and capabilities related to global change;

Invites Unesco and Member States to allocate the ways and means required to strengthen the IGBP-related scientific programmes and ocean monitoring activities of the Commission; and

Instructs the Secretary to examine ways of co-sponsoring a proposal for an IGBP programme on Past Global Change, using the IGCP as a model for implementation.

Annex to Resolution XV-6

1. Ocean Dynamics and Climate (TOGA; WOCE; etc.)

- variability and change of the global ocean environment and its interaction with the atmosphere
- data bases, numerical models and physical ocean process description
- coastal processes

2. Ocean Science in Relation to Living Resources (OSLR)

- plankton blooms (in co-operation with GIPME)
- changes in species dominance
- recruitment and fish stock variability (IREP)
- coral bandings

3. Ocean Science in Relation to Non-Living Resources (OSNLR)

- mapping of past sea-level and environmental changes
- establishing past global change from the coastal sedimentary record
- sediment flux and coastal studies

4. Mapping

- digital data bases

5. Global Investigation of Pollution in the Marine Environment (GIPME)

- regional monitoring networks and infrastructure
- standard reference material
- training in analytical/sampling methodology
- intercomparison/intercalibration exercises
- mapping of the distribution of contaminants in the marine environment
- investigation of anthropogenic changes in the World Ocean and the different regions thereof

6. Ocean Services

- temperature, salinity and currents in the upper layer (e.g. above the main thermocline) and monthly mean sea-level products: Integrated Global Ocean Services System (IGOSS) jointly with WMO
- standard sea-level data: Global Sea-Level Observing System (GLOSS)
- drifting buoy data: Drifting-Buoy Co-operation Panel, jointly with WMO
- global exchange of various kinds of oceanographic data in various time frames: International Oceanographic Data and Information Exchange (IODE)
- exchange of information : Aquatic Science and Fisheries Information System (ASFIS), jointly with FAO

7. Training, Education and Mutual Assistance in the Marine Sciences (TEMA)

- training, workshops, symposia and other such actions for the items above

Resolution XV-7

FIFTH SESSION OF THE JOINT IOC-WMO WORKING COMMITTEE FOR THE INTEGRATED GLOBAL OCEAN SERVICES SYSTEM (IGOSS)

The Intergovernmental Oceanographic Commission,

Having considered the Summary Report of the Fifth Session of the Joint IOC-WMO Working Committee for IGOSS,

Noting WMO Resolution 9 (EC-XLI) on the same topic, and appreciating the actions which WMO has taken on the recommendations,

Decides:

(i) **to accept** the Report;

(ii) **to note** Resolutions 1 to 4 (JWC-IGOSS-V);

(iii) **to approve** Recommendations 1 to 12 (JWC-IGOSS-V), including requests:

(a) to the Chairman of the Joint IOC-WMO Committee for IGOSS and to the Chairman of the Technical Committee on IODE in consultation with the Secretariats of the IOC and WMO to take appropriate co-operative action;

(b) to the Seminar/Workshop on IGOSS Products to provide advice on future operational ocean-observing systems; and

(c) to the Group of Experts on GLOSS to advise on the implementation of the sea-level related IGOSS projects as operational components of the Global Sea-Level Observing System;

(iv) **to take into account** Recommendation 13 (JWC-IGOSS-V) -Review of Previous Resolutions of the IOC and WMO Executive Councils Relevant to the Field of Activity of the Joint IOC-WMO Working Committee for IGOSS- when reviewing the status of previous IOC Resolutions;

Instructs the Secretary to bring the recommendations to the attention of all concerned and to provide, in conjunction with the Secretary-General of WMO, the necessary support for the implementation of the recommendations;

Further instructs the Secretary to prepare proposals for increased Secretariat staff support to service activities of the Commission, to be submitted to the next session of the Executive Council;

Urges Member States to submit accurate statistics on messages submitted to, and received from, the Global Telecommunications System in a timely fashion, so as to reduce data losses to a minimum;

Invites UNDP and other funding agencies to consider favourably the establishment of appropriate long-term funding support, and Member States to consider providing material and other assistance, for the specialized long-term education and training related to IGOSS.

(Note: This Resolution replaces Resolution EC-XIX.5 which is no longer in force.)

Resolution XV-8

GLOBAL SEA-LEVEL OBSERVING SYSTEM (GLOSS)

The Intergovernmental Oceanographic Commission,

Having reviewed the proposed Implementation Plan for GLOSS (Doc. IOC-XV/8 Annex 4),

Noting Recommendation TC-OPC-III.4 of the Third Session of the IOC Technical Committee on Ocean Processes and Climate formulated on the basis of recommendations of the First Session of the Group of Experts on GLOSS, held at Bidston, UK, 19-23 June 1989,

Noting also with appreciation the assistance provided by Australia, France, Federal Republic of Germany, India, Sweden, United Kingdom, and United States to developing countries in setting up GLOSS stations and training their specialists,

Approves the GLOSS Implementation Plan (Doc. IOC-XV/8 Annex 4), and its publication in the IOC Technical series;

Urges Member States to participate actively in GLOSS by establishing GLOSS stations and implementing the transfer of data by the most effective means;

Approves the GLOSS Work Plan for 1990-1991 prepared by the First Session of the Group of Experts on GLOSS;

Invites Member States to contribute to the IOC Trust Fund so that the implementation of actions proposed in the GLOSS Implementation Plan can be furthered;

Urges Member States to continue their assistance to developing countries in setting up GLOSS stations and training specialists from such countries through IOC or on a bilateral and/or multilateral basis;

Decides to publish a GLOSS Brochure, Newsletter and Handbook, and **instructs** the Secretary to make the necessary arrangements for such publication;

Requests the regional subsidiary bodies of the Commission, particularly IOCARIBE and IOCEA at their forthcoming meetings, to consider the implementation of regional components of GLOSS and ways in which they can assist in the co-ordination and implementation of the GLOSS programme.

Resolution XV-9

ESTABLISHMENT OF AN IOC SUB-COMMISSION FOR THE WESTERN PACIFIC (WESTPAC)

The Intergovernmental Oceanographic Commission,

Recalling Recommendation WESTPAC-IV.1, in which the Regional Committee for WESTPAC has requested the Assembly to establish an IOC Sub-Commission for the Western Pacific (WESTPAC) to replace the present Regional Committee,

Recalling the Guidelines for the Structure and Responsibilities of IOC Sub-Commissions (ref: Summary Report of the Twelfth Session of the IOC Assembly (Document SC/MD/73, Annex V, November 1982) which set basic conditions for the establishment of a regional Sub-Commission,

Noting with satisfaction the considerable progress achieved by WESTPAC during the past ten years, as summarized in Document IOC/INF-773,

Appreciating the financial and in-kind contributions of Member States over the past ten years,

Being satisfied that the budget and secretariat requirements for the Regional Sub-Commission will be made available by the IOC and Member States through, inter alia, contributions to trust funds such as those of IOC and Unesco, the IOC Regular Programme, and contributions in kind,

Establishes the IOC Sub-Commission for the Western Pacific (WESTPAC) with the Terms of Reference given in Annex I to this Resolution, to replace the Regional Committee established by Resolution X-11, and to become operative with the convening of the First Session of the Sub-Commission;

Instructs the Secretary IOC to invite all interested Member States of the Commission to contribute to WESTPAC's future development.

Annex to Resolution XV-9

TERMS OF REFERENCE OF THE SUB-COMMISSION FOR THE WESTERN PACIFIC

The Sub-Commission for the Western Pacific shall endeavour to:

(i) define regional problems, the solution of which calls for international co-operation, and promote, develop and co-ordinate the required marine scientific research programmes and related activities;

(ii) implement and co-ordinate the regional components of global marine scientific research programmes and activities of the Commission;

(iii) promote the development and use, at the regional level, of ocean services and related supporting activities, co-ordinated or maintained by the Commission;

(iv) facilitate the exchange of scientific data and information and the transfer of knowledge resulting from marine scientific research, especially to developing countries in the region;

(v) assist with the identification of training, education and mutual assistance needs in the region, particularly those relating to the programmes of the Sub-Commission, and promote the required TEMA activities;

(vi) make recommendations to the governing bodies of the Commission on policy matters, and submit proposals on the budgetary and other forms of support required for the programme of work of the Sub-Commission;

(vii) co-operate with other subsidiary bodies of the Commission on technical matters of common interest;

(viii) provide general guidance and serve as a mechanism for Member States for the formulation, evaluation and follow-up of proposals for extra-budgetary projects aimed at strengthening national and regional capabilities in marine scientific research and the establishment of common institutions, services and facilities (e.g. centres, networks, etc.);

(ix) co-operate with the regional subsidiary bodies of the UN organizations members of ICSPRO and of other UN organizations as well as regional bodies collaborating with the Commission;

(x) when appropriate:

(a) form Task Teams to carry out specific assignments,

(b) establish Groups of Experts, and

(c) organize technical meetings (e.g., workshops), provided costs fall within the budget allocated to them or extrabudgetary funding is available for that purpose; otherwise recommendations to that effect shall be submitted to the governing bodies of the Commission for their consideration and approval.

Membership: Membership shall be open to all interested Member States of the Commission willing to participate actively in the work of the regional Sub-Commission.

Resolution XV-10

IOC CONTRIBUTION TO THE THIRD UNESCO MEDIUM-TERM PLAN

The Intergovernmental Oceanographic Commission,

Recalling the views expressed by the IOC Executive Council at its Twenty-first Session and by its Fourteenth Assembly, through Resolutions EC-XXI.7 and XIV-16,

Further recalling that, in regard to the Second Unesco Medium-Term Plan, the Commission, through Resolution EC-XIV.1, had made clear its position that a doubling in resources and staff was required in order that the IOC might respond to the wishes of its Member States and carry out the programmes considered as being of vital importance to scientific and socio-economic development,

Bearing in mind that the revisions to the IOC Statutes, as approved by the Twenty-fourth Unesco General Conference, have broadened its functions and mandate and conferred upon the Commission functional autonomy within Unesco,

Reaffirming its position taken in Resolution EC-XXI.7 and the advice provided therein to Unesco, duly transmitted, in accordance with Article 2 (i) of the Statutes of the Commission, to the Director-General as the IOC contribution to formulation of the Draft Third Unesco Medium-Term Plan,

Emphasizing that the ocean plays a key role in global change, and that the Commission is the competent body within the UN System to address marine aspects of global change,

Having studied the IOC component of the Draft Third Unesco Medium-Term Plan (Draft 25C/4) contained within Sub-programme II.2.2 in the light of the proposals made by the Commission to Unesco on this matter,

Stresses the necessity, as decided by the Twenty-third General Conference, of giving high visibility to the IOC Programmes within the medium-term programming of Unesco and the biennial programme and budget documents;

Conveys to the Director-General its position that it is most imperative to begin to rebuild the IOC Secretariat, initially by the re-establishment of abolished posts, so that the core staffing of the Commission, as provided by Unesco, meets the basic requirements of programme implementation;

Considers it important to convey to the Director-General its view that the IOC component of the Draft Third Unesco Medium-Term Plan as found in the Draft 25 C/4 does not adequately reflect the views of the Commission and recommendations made to Unesco as provided for under Article 2 (i) of the IOC Statutes;

Submits to the Director-General its proposal, as found in the Annex to this Resolution, for amending the section of the Draft 25 C/4 pertaining to the Commission;

Calls on Member States to ensure that the views of the Commission are adequately reflected in national positions when this subject is discussed at the Twenty-fifth Session of the Unesco General Conference, through transmission of this Resolution, together with additional information and appropriate briefing material, to the members of their national delegations to the General Conference;

Requests the Chairman and First Vice-Chairman to raise this matter with the Director-General during their periodic consultations.

Annex to Resolution XV-10

The following major directions have been identified by the Intergovernmental Oceanographic Commission (IOC) as marking the concerted action of its Member States through the end of the century, and forming the basis of the IOC contribution to the Third Unesco Medium-Term Plan 1990-95:

(i) The strengthening of the ocean partnership through joint commitment to research goals at the global and regional levels and to the building up of required human and technological resources through accelerated implementation of the Unesco-IOC Comprehensive Plan for a Major Assistance Programme as a component of IOC training, education and mutual assistance (TEMA);

(ii) The greatly accelerated development of ocean services, leading to a 'global integrated ocean observing system', in support of marine research and ocean use, as a common service to Member States and their scientific communities;

(iii) The development and implementation of scientific programmes such as: oceanographic aspects of global climate research; study of the marine environment as a whole, both coastal and open-ocean; research and monitoring of marine pollution; ocean science in relation to living and non-living resources; and ocean mapping;

(iv) The implementation of marine science activities in a vigorous and united marine science programme, properly co-ordinated with other relevant programmes, using, to that effect, the IOC.

Resolution XV-11

PROPOSAL ON THE IOC PROGRAMME OF WORK AND BUDGET FOR 1990-91

The Intergovernmental Oceanographic Commission,

A

Having considered the Proposal on the IOC Programme of Work and Budget for 1990-91, contained in Document IOC-XV/8 Annex 7,

Noting that the IOC Programme of Work and Budget contains components to be funded through: (i) Unesco (Draft 25 C/5: Sub-programme II.2.2: activities 4-8) and (ii) contributions to the IOC Trust Fund,

Approves, as a minimal basis for future planning, the proposal for the IOC Programme and Budget for 1990-91;

B

With regard to Member States,

Noting that the resources made available to the Commission through voluntary contributions of Member States to the IOC Trust Fund, secondment of staff and in-kind support have substantially contributed to effective implementation of IOC Programmes,

Acknowledges, with appreciation, advance indication by Member States of further contributions and support;

Urges Member States to increase their efforts to provide adequate funding and staff, through contributions to the IOC Trust Fund and other means, complementary to the support provided by Unesco;

Instructs the Secretary to implement progressively the IOC Programme of Work and Budget, taking into account decisions of the Assembly and Executive Council and to draw to the attention of the Twenty-third Session of the Executive Council any difficulties regarding funding and staff resources so that adjustments to planned programme implementation may be made, should the circumstances so require;

Requests the Chairman to continue to exercise his good offices with Member States in regard to such voluntary contributions, in consultation with the First and Second Vice-Chairmen, and with the assistance of the Secretary.

C

With regard to Unesco,

Having received with satisfaction the statement from the Director-General that a sum of $350,000 above the budget ceiling has been foreseen for IOC activities within the Draft 25 C/5, and that he would receive favourably suggestions for further strengthening of the Commission and its programmes,

Noting further that modest reinforcement by Unesco of the IOC Secretariat staffing is likewise foreseen, but that this is far below the increase required to begin the process of restoring an adequate level of staff for effective implementation of the IOC programmes,

Considers that the programme funds forecast for IOC within the Draft 25 C/5 provide a framework for the Commission's basic activities, but fall far short of the requirements for effective implementation of the programmes as approved by IOC governing bodies;

Conveys to the Director-General its appreciation for his understanding of the Commission's requirements and the steps already taken to provide in 1991 one additional staff position;

Draws the attention of the Director-General to the growing gap, as indicated below, between staff positions provided by Unesco and those forecast through Resolution EC-XIV.1, by which the Commission advised Unesco of its expected requirements in personnel and funds during the Second Medium-Term Plan (1984-89):

	Staff Forecast through Resolution EC-XIV.1		Posts provided by Unesco	
	P	GS	P	GS
1983	11	9	11	9
1984	16	14	14	14
1989	22	18	8	10
1991			9	10

Concludes that the highest priority should be accorded to IOC staffing requirements so as to ensure that the IOC Secretariat has a core of professional and support staff, funded through Unesco at an adequate level, to serve effectively the Commission's programme implementation and facilitate the integration of staff provided by Member States;

Calls on Member States to take energetic action through appropriate national channels so as to ensure that the Commission's views are taken into account during debate at the General Conference;

Invites the Director-General to transmit this Resolution to the Twenty-fifth Session of the Unesco General Conference.

Resolution XV-12

Ad hoc STUDY GROUP ON MEASURES TO ENSURE ADEQUATE AND DEPENDABLE RESOURCES FOR THE COMMISSION'S PROGRAMME OF WORK

The Intergovernmental Oceanographic Commission,

Recalling IOC Resolution XIV-20, by which it established an ad hoc Study Group on Measures to Ensure Adequate and Dependable Resources for the Commission's Programme of Work (FURES),

Accepts the Summary Report of the First Session of the ad hoc Study Group;

Decides to extend the mandate of the ad hoc Study Group, with the revised terms of reference as found in the Annex.

Annex to Resolution XV-12

REVISED TERMS OF REFERENCE OF THE Ad hoc STUDY GROUP ON MEASURES TO ENSURE ADEQUATE AND DEPENDABLE RESOURCES FOR THE COMMISSION'S PROGRAMME OF WORK

The following tasks are identified for the intersessional work of FURES, which includes, inter alia:

(i) consideration of ways and means of documenting and codifying the implications of functional autonomy for the Commission, through the IOC Manual or another appropriate vehicle;

(ii) consideration of the feasibility of setting up a Pledging System by which Member States could create more dependable conditions for the provision of financial resources to the Commission beyond those presently provided;

(iii) a study of existing conventions and other legal instruments with a view to their eventual adaptation to the particular case of the IOC within a perspective on long-term development of the Commission;

(iv) a study of the Rules of Procedure and the Statutes in order to identify omissions or points that require clarification in regard to the present practice and experience of the Commission;

(v) a study on how to facilitate the steps required by Member States as they endeavour to apply at the national level the guidelines regarding their responsibilities towards the Commission, or, in the event that the Assembly so decides, to take the above into account while continuing to develop an appropriate list of such responsibilities;

(vi) a study on the organization and scheduling of sessions of IOC Governing Bodies within the context of the Commission's functions and programmes.

Resolution XV-13

MEMBERSHIP OF THE EXECUTIVE COUNCIL

The Intergovernmental Oceanographic Commission,

Noting the amendment to Article 5, paragraph 4(b), to its Statutes, as adopted by the General Conference of Unesco at its twenty-fourth session and being in force since 18 November 1987,

Recognizing that it is necessary to bring its Rules of Procedure into line with the amended Statutes,

Decides to amend Rule of Procedure No. 18, paragraph 1, to read:

> *"The Executive Council shall consist of the Chairman, the four Vice-Chairmen and such a number of designated representatives of those Member States of the Commission elected by the Assembly as provided for under paragraph 4(b) of Article 5 of the Statutes of the Commission. State Members of the Executive Council shall be eligible for re-election."*

Thus, there is a two-way traffic flow in the participation, benefitting global, regional and sub-regional concerns.

However, there is more to the oceans than problems. In our preoccupation with the global and regional environmental problems we are facing, we must not forget that the oceans also hold promises for economic development. We have utilized the living resources of the oceans for thousands of years, but our utilization has been on the level of the hunter or the collector. Only recently have we seen a major development in the application of science and technology in cultivating the ocean resources, and I feel that we are at the beginning of a process that will lead to increased harvests and employment in many coastal states. The utilization of the non-living resources is still only in its very early stage, but the Exclusive Economic Zones under the new ocean regime give many coastal states vast opportunities for resource utilization.

The utilization of the living and non-living resources of the oceans demands application of science and technology. The ocean is a hostile environment for man, and to utilize its resources we must know its behaviour and develop adequate technologies. This development of methodology will take place all over the world, and it is therefore important that scientific and technological data and information be globally available. The IOC Working Committee on International Oceanographic Data Exchange (IODE) has a particularly important role to play in the dissemination of oceanographic data and information to marine science institutions.

At about the time of our 14th Assembly in 1987, the World Commission on the Environment and Development issued their report: "Our Common Future", the so-called Brundtland report, which has had a significant influence on the world environmental debate. The report is unique in that it clearly demonstrates the linkage between environmental protection and socio-economic development. Throughout the report there is reference to the need for "sustainable development", which means that we owe it to future generations to utilize only the interest on the global capital, that is the earth's resources, while maintaining the capital itself. Naturally, this applies also to the resources of the oceans, and I am pleased to say that the IOC has developed programmes and structures which are highly relevant with regard to sustainable development of the oceans resources and protection of the environment. Our programmes Ocean Science in Relation to Living Resources (OSLR), Ocean Science in Relation to Non-living Resources (OSNLR) and Global Investigation of Pollution in the Marine Environment (GIPME) are obviously highly relevant, but perhaps even more so are the activities in Training, Education and Mutual Assistance (TEMA) working closely with the other programmes. "Sustainable development" requires understanding of complex sets of interacting processes, and such understanding can only be achieved through the application of science. The development of scientific manpower and associated infrastructures must therefore always be high priority activities in the IOC programmes.

One of the most important events which took place in the IOC during the intersessional period was the change of Secretary of the Commission. Dr. Mario Ruivo who had been the IOC Secretary since 1980 retired from his post at the end of 1988, and the Executive Council of the Commission at its 21st Session was consulted by the Director-General about the appointment of Dr. Ruivo's successor. On the basis of the consultation with the Executive Council the Director-General appointed Dr. Gunnar Kullenberg as new Secretary of the Commission.

The appointment of Secretary is particularly meaningful for the Commission. While elected officers come and go, the Secretary is a guarantee of continuity, and he embodies the corporate information content of the Commission as a whole. The thorough process of selection has given IOC Secretaries of stature and integrity, whose dedication to serve the Commission goes far beyond the call of duty. Dr. Mario Ruivo is certainly no exception to this rule. Even before he came to IOC he had many years of experience in international marine science matters from his service in the FAO, and he has also over long periods of time played a major role in the development of marine science and fisheries investigations in his home country. During his service as IOC Secretary, the Commission participated actively in the negotiations on the UN Convention on the Law of the Sea, a major revision of the IOC Statutes enhanced the role of regional programmes and ocean services in the activities of the Commission, the Comprehensive Plan for TEMA was developed, and IOC became actively involved in the oceanographic components of the research programmes related to climatic change. To me it has been a privilege to know Mario Ruivo both as a dedicated international servant, as a compassionate and intellectual human being and as a personal friend. On behalf of the Intergovernmental Oceanographic

ANNEX III

ADDRESSES

A. Opening Address by Professor Ulf Lie,
Chairman of the Intergovernmental Oceanographic Commission (IOC),
on 4 July 1989

Mr. Director-General,
Mr. Assistant Director-General for Science,
Distinguished Delegates, Representatives and Observers,
Ladies and Gentlemen,

It is an honour for me to address the IOC Assembly as Chairman of the Commission, and I am confident that I have the strong support of all the delegates when I take this opportunity to welcome you, Mr. Director-General, to the opening ceremony. The delegations of Member States to the IOC Assembly represent institutions with a broad international competence in the area of marine science and services, ready to render support to the development and execution of ocean science programmes in Unesco.

In the period since the Fourteenth Session of the IOC Assembly there has been an increasing awareness of the importance of the oceans for the survival and well-being of mankind. The World Climate Research Programme of WMO-ICSU has been in existence since 1979, but it seems that it is only during recent years that important concepts such as "stratospheric ozone reduction" and "greenhouse effect" have entered everybody's vocabulary. It has also during recent years become quite clear that unless we understand the role the oceans play with regard to the development of the earth's climate and can provide adequate ocean observations, we will not have the ability to make reliable predictions for climatic changes which the international community needs in order to take the necessary political decisions. Therefore, we have witnessed the development of large-scale or global research programmes such as the Tropical Oceans and Global Atmosphere programme (TOGA) and the World Ocean Circulation Experiment (WOCE). IOC participates in these programmes in co-operation with SCOR through the joint Committee on Climatic Changes and the Oceans (CCCO).

In recent years ICSU has taken the initiative to develop the International Geosphere-Biosphere Programme (IGBP), which also deals with global change and the oceans. IOC has a number of programmes and subsidiary bodies which are of relevance to IGBP, and a close co-operation with ICSU must therefore be expected as the IGBP programme develops further and reaches the stage of implementation.

The central subsidiary body within IOC dealing with the issues of climate and global change is the Technical Committee for Ocean Processes and Climate (TC/OPC). The third session of the TC/OPC, which was held here in Paris last week, discussed a number of important issues related to IOC's involvement in climate research, and the recommendations from that meeting will be before us in the Assembly.

The programmes related to climate change are global programmes, that is they deal with problems which may affect humanity and earth's life-supporting system as a whole, locally regionally and globally. The magnitude of the problem is such that it must be studied in a truly global context with participation of scientists from all coastal states. Furthermore, states will have to take concerted political actions in order to reduce the destruction of our common environment, and such action will depend on advice from national scientific expertise. IOC has a special responsibility to ensure a widest possible international participation in the programmes related to climate change. With its 117 Member States, the Commission has a wide network of contacts with scientists and governmental institutions all over the world, and the regional programmes of the Commission provide excellent structures for engaging developing countries in the global programmes. This requires, however, that the programmes of global concern be developed with regard to the specific needs and conditions in the various regions. To paraphrase a well-known expression: "Think global, act regional". The participation of all countries will not only contribute to solving the global issues, but the access to the scientific achievements in global programmes will also result in strengthening of the capacity to deal specifically with regional problems.

Commission I will with these few words thank you, Mario, for your contribution to enhance the role of the Commission in international oceanography.

With the appointment of Dr. Gunnar Kullenberg as Mario Ruivo's successor I am confident that the IOC Secretariat is in the best hands. Dr. Kullenberg is an oceanographer of the highest international standards, who has contributed to studies of the oceans both in his homeland and in international science. His long affiliation with the International Council for the Exploration of the Sea has also given him valuable experience in the organization of international scientific programmes and in efficient management. On behalf of the Intergovernmental Oceanographic Commission I welcome you, Gunnar, as the new Secretary of the Commission.

Earlier in my speech I have tried to demonstrate that IOC has developed appropriate organizational structures to deal with marine science and service components in large-scale environmental programmes, as well as with the application of marine science and technology for rational utilization of marine resources within the concept of "sustainable development". However, it seems to me that the real bottle-neck for an efficient implementation of the programmes is the shortage of staff in the IOC Secretariat. Because of the stern austerity measures Unesco has had to make during the intersessional period, as well as the withdrawal of outposted staff members from some of the UN agencies co-operating under the ICSPRO agreement, the regular programme staff shortage has become critical. To give an example, at present there are 7 professional staff members and 8 general service staff in post, as compared to 14 professionals and 13 general service staff in 1984. During the same period of time the programmes of IOC were greatly expanded, and one should remember that the IOC Governing Bodies envisaged a doubling of staff during this period.

The shortage of staff not only places the planning and execution of IOC programmes in jeopardy, it has also a direct effect on the work situation of the remaining staff members. In order to cope with the heavy work load that we, as Member States put on them, they have to work long hours and take on tasks and responsibilities which go beyond the limitations of their job descriptions. This applies to professionals and general service personnel alike.

However, there has been some improvement in the situation recently, and in this regard I want to express the Commission's gratitude to you, Mr. Director-General, for your decision to place at the disposal of IOC an additional $200,000. This has allowed the Commission to arrange meetings which had been postponed, such as that of IOCARIBE, and to hire consultants to assist the Secretariat.

Unesco has also in principle offered more stable employment conditions to the so-called supernumerary general service staff who had been working for the IOC on very short-term contracts, often for many years, and their skills and dedication have been of critical importance for the Secretariat during these difficult times.

The IOC Member States have given invaluable support to the Commission by secondment of professional and general service staff members for specific IOC programmes, and by contributions to the IOC Funds-in-Trust. I gratefully acknowledge these generous and responsible actions of Member States which demonstrate concern for the programmes of the Commission, and I hope that Member States will continue to give their direct support to the IOC budget. However, the seconded staff members are as a rule provided for a limited period of time and for specific tasks. For long-term planning for IOC activities and in order to ascertain continuity in the major programmes, I take this opportunity to plead to you, Mr. Director-General, to continue your efforts to provide IOC with additional staff members on the regular budget of Unesco.

Thank you very much for your attention.

B. Address by Mr Federico Mayor,
Director-General of Unesco,
on the occasion of the Fifteenth Session of the IOC Assembly

Mr. Chairman,

I am very pleased to welcome you all to the IOC Assembly at Unesco House. Among the participants, I see the faces of persons who have been intimately connected with the work of the Commission for numerous years. I am particularly glad to greet Dr. Mario Ruivo, head of the Portuguese Delegation, who was Secretary of the IOC for nearly eight years until his retirement at the end of last year, and who contributed substantially to the development of the Commission's activities. Likewise, it is a pleasure to recognize as the head of the United Kingdom Delegation, Mr. Desmond Scott, who served as Secretary of the IOC from 1972 to 1979 just before Dr. Mario Ruivo.

Last year, when I had the pleasure of addressing the opening session of your Executive Council, I referred to the particular interest of Unesco and myself in the steady progress of IOC and to its new dimensions. Today I wish to reflect with you not only on new dimensions but also on new horizons, both for your Commission and for Unesco itself.

The recently completed 131st session of the Unesco Executive Board has studied the steps to be taken in the coming six years to weave new threads into the fabric of the Organization so that it can fully respond to the aspirations of human society as set forth in its Constitution. I sense that the IOC is following the same path, not only as a consequence of the revised Statutes, which is your own constitutional text, but - and perhaps more significantly - because the Member States of the Commission have stated and demonstrated their commitment to joining forces to obtain a better understanding of one of the major parts of the life-supporting system on our planet.

'Setting forth' carries with it a connotation of adventure and, to a certain extent, venture into the interior, moving forward into the unknown. In this respect, one can say that the ocean and its processes are indeed still not fully comprehended and even that the solutions to some questions merely open the doors to others, especially given the complex inter-relationships that mark the marine environment. It should be recognized that IOC for a number of years has drawn our attention to the need for and excitement of studying the world ocean, its resources and interaction with other parts of our environment. The Commission has also identified the means required to respond adequately to the tasks before us.

IOC has often, and rightly, turned to its parent organization, Unesco, for the basic impetus and support required to synthesize and mobilize the will of the Commission adequately to respond to its responsibilities. In 1981, with a long-range view to what was before us, you proposed the doubling of Unesco's support to the IOC, both programme funds and staff, over the six-year period of the second Unesco Medium-term Plan. As you have been informed many times since, it is most unfortunate that, despite approval of an increase for IOC of over 25% by the General Conference at its twenty-second session, subsequent financial restrictions have resulted in a situation where the level of Unesco support to IOC is now much the same as it was at the start of this decade.

It was within this perspective that I went on record at your Executive Council to affirm that "the Organization was ready to make an immense effort to bring about the conditions that will enable the Commission to restore the rate of growth envisaged". With this in mind, I approved an exceptional, additional allocation of $200,000 for the present biennium and have also proposed to the 25th Unesco General Conference budgetary reinforcement of $350,000 for IOC over the standard ceilings as well as the upgrading of a P-5 post to D-1 to act as Deputy Secretary IOC and the creation of a new P-4 post as of the second year of the next biennium. Following those decisions, the Secretary IOC recommended that the IOC Secretariat be strengthened and outlined his ideas in a set of proposals which are presently being considered. Thus, positive steps have been taken. Although, I am fully aware of the staff shortage in the IOC Secretariat, I am maintaining a very close watch over the staffing situation in the Organization so as to find ways of further strengthening the IOC Secretariat; and, as I said recently to you, Mr. Chairman, I am so convinced of the important role IOC has today that I will always be ready, as I have done during the present biennium, to consider additional support for ocean activities. Extra-budgetary support will also be increased, in concert with relevant UN organizations and other intergovernmental and non-governmental organizations.

Having said this, I feel we should look together towards the future, working with all the possibilities at our disposal, not the least of which are the proven capacities of IOC Member States to join forces in what we like to term the ocean partnership. I should like to add a few thoughts to the long-standing concept of this partnership, which might serve to give it an enlarged dimension, drawing on the concepts that IOC itself presented to me in transmitting Resolution EC-XXI.7 on the Unesco Medium-Term Plan for 1990-95.

The first arises from your statement that 'Decisions are needed now to enable the world community, by a collective effort at national, regional and global levels, to understand global change of which the ocean is a major element'. This is a simple and direct message that carries with it a multitude of responsibilities and challenges. Global change cannot be adequately grasped without taking into account local and regional changes, but at the same time, as we now know in regard to the 'El Nino phenomenon', local changes can only be perceived and predicted in all of their dimensions by taking note of regional and global information, through a global outlook. We must, therefore, seek the right balance of local, regional and global studies and data collection, and association between scientific and societal priorities as they arise. Here I would say that IOC is following an innovative and appropriate path in its development of closely related global and regional programmes. Likewise it appears to me innovative of IOC actively to facilitate provision of scientific information and results to the users on national and international levels, for instance through direct involvement in regional assessments of marine pollution and the impact of climate change.

The IOC has also underlined the necessity of 'greatly accelerated development of ocean services, including observing and monitoring systems', an indispensable tool for study of the marine environment, but one which needs to evolve as a function of new technology and new concepts. By this I am obviously thinking of scales ranging from satellite observations and large data sets on the one hand, to processing of information and data on micro-computers on the other. Added to this are newer aspects, many of which have emerged from your own programmes: the need to match observational and monitoring capabilities with comparable and quality-assured data; development of early warning and sentinel systems, whether it be for traditional natural hazards such as tsunamis, or for the emerging human-induced environmental impact and its related biological effects; and the studies undertaken and envisaged in ocean dynamics and climate, which, I am pleased to note, have been developed in close co-operation with the non-governmental community. These will certainly require adjustments in resources and the most appropriate use of intergovernmental structures if we wish to attain our common goals of observing, understanding and predicting the role of the ocean in controlling our environment, its resources and its production capacity.

Within the next Medium-Term Plan's Major Programme Area II, Science for Progress and the Environment, the subprogramme entitled "The marine sciences for the rational use of the marine environment and its resources" has a prominent role, covering all the aspects referred to in your proposal to me.

The magnitude of the work before the oceanographic community, and thus before the Commission, while dismaying the faint-hearted, can be seen as a stimulus to those who set forth on adventures. As I said in presenting the draft Medium-Term Plan to the Unesco Executive Board, we must ensure that our programmes correspond to humankind's expectations as this century draws to its close: constructing peace, ensuring solidarity in development, and making peace with nature.

It appears to me that these thoughts are already echoed by the IOC, not only in your statement regarding the Commission's contribution to the planning of future programmes of Unesco, but most importantly in your acts. IOC has clearly understood that the development process must be founded on a solid scientific and technological base, with associated human resources. It has also understood that no single organization can or should work in isolation in dealing with the complexities of the ocean and its use: co-operation is needed, between national institutions, between states and among organizations with the full involvement of the scientific community. These interactions are the same requirements as for the study of the ocean, namely to cover local, regional and global scales, with a corresponding holistic view of the ocean. ICSPRO and the special co-ordination role of IOC in the UN System, your co-operation with UNEP, and the co-operation with ICSU-SCOR are examples of this. I am pleased to see that through such interaction IOC reinforces Unesco's overall co-operation with its UN partners, and the international scientific community.

With this solid foundation laid by the Commission, let us not be afraid of the work that lies ahead but focus our minds and resources on the opportunities as they unfold. This session of your Assembly offers for your consideration and decision a wide range of subjects that span almost all aspects of ocean science and services, within which such opportunities are waiting to be taken. May I close by affirming my faith in the IOC and my appreciation of the services it renders to the marine science community, to its Member States and to Unesco.

I will follow your debates with close attention and I will do my best - according to the priorities fixed by the Member States - to support the activities of IOC.

C. Expression of appreciation and gratitude to Dr. Mario Ruivo, Past Secretary IOC, by Dr. Agustin Ayala-Castanares, former Chairman IOC

It is a pleasure and a great honour for me to be addressing you at the inaugural ceremony of this Fifteenth Session of the Assembly of the Intergovernmental Oceanographic Commission. I am grateful to my friend Professor Ulf Lie for giving me the opportunity to say these few words to you.

It is also a great responsibility, as I shall be talking about a prominent figure in the Commission, Dr. Mario Ruivo, who, as you all know, came to the end of his term as Secretary of IOC on 31 December 1988, after nearly 10 years of service.

I have known Dr. Ruivo since 1965, when he took part in the FAO World Scientific Conference on the Biology and Culture of Shrimps and Prawns which he helped to organize in Mexico City.

When I first began to work with IOC in 1968, one of the people who impressed me most was the FAO representative, Dr. Mario Ruivo, well known as one of the founders of the Commission.

I have had occasion to see him at work in a wide variety of posts, first as a staff member of FAO, then as Secretary of State for Fisheries of Portugal, later as Minister for Foreign Affairs of his country and Head of the Portuguese Delegation to the Third United Nations Conference on the Law of the Sea, then again as Portuguese Delegate to IOC and subsequently as First Chairman of our Working Committee for GIPME and finally as Secretary of the Commission.

I have had a very close personal association with Dr. Ruivo, especially after 1979, when I was re-elected Chairman of the Commission and he was appointed Secretary, which meant that we worked closely together. I have always been impressed by his human qualities especially his enthusiasm, intelligence, dedication and competence, his total sense of commitment and duty and his knowledge of the United Nations system and identification with the United Nations spirit, all of which have left a profound imprint on a very full career marked by successes and great satisfaction intricately bound up with the development of our Commission and underpinned by his constant endeavour to gain a deeper understanding of the oceans - the great new world to be pioneered by humankind.

I have had the opportunity to follow his work closely and I can assure you that, through his attitude of impartiality towards Member States, whatever their size, power and political position, by which he always succeeded in achieving consensus among the delegations, he won the general admiration and esteem of his colleagues, sometimes tempered by reservations, but always accompanied by respect, never indifference. He has left an indelible imprint on the Commission which he consolidated and extended to give it truly international scope, despite the major problems which it had to face and which he solved with great tact, taking into account the aspirations of Member States and the historic needs created by the emerging New Ocean Regime.

Over the years we have found many points of view in common and formed a deep and lasting friendship, which we shared throughout the crucial periods of IOC's activity with our great friends Inocencio Ronquillo and Marie-Annie Martin Sanz, both of whom suffered untimely death. I hope that we shall be able to sustain this enriching friendship and continue to work together as representatives of

Portugal and Mexico in the Commission's future activities, or in any other task which enables us to move closer to our goal, which is the development of oceanography for the welfare of humankind.

On behalf of my colleagues present at this meeting, I should like to express gratitude to Dr. Ruivo for the great devotion which he has contributed to the development of the Commission's work throughout these unforgettable years.

I have also great pleasure in greeting him cordially and welcoming him back to Unesco as Delegate of Portugal, and I am sure that in this new capacity he will continue to make the most valuable contributions to IOC.

We are indeed fortunate in the Commission to be able to continue our work with a personality of his stature and human values, holding such a firm belief in the great importance of peaceful international co-operation for the benefit of the world and all its Member States.

Finally, I should like to wish him every success in the many new activities which he is undertaking in his own country where the President of the Republic has just given recognition to his outstanding work by awarding him the Order of Prince Henry of Portugal, which is the highest national distinction in Portugal for services rendered to the country in the fields of science, culture and international co-operation. Congratulations, Mario!

I also give our warmest welcome and express our best wishes to the new Secretary, Dr. Gunnar Kullenberg, a most eminent figure in the field of oceanography, as has been amply proved within the Commission, and who is a worthy successor to Dr. Ruivo. I am sure that he will organize the work of the Commission with success.- Welcome, Gunnar.

In conclusion, Ladies and Gentlemen, I invite you to applaud them both.

Thank you.

D. Statement by Dr. Gunnar Kullenberg, Secretary IOC,
on recent developments of IOC Programmes
during the first half of 1989

Mr. Chairman,

With reference to Document IOC-XV/6 entitled "Report of the Secretary on Intersessional Activities during 1988", I would like to emphasize a few points and also supplement the information given in the Document by covering developments during the first six months of this year.

In the area of Ocean Dynamics and Climate, the implementation of TOGA has continued to move forward, with further strengthening of the observational networks, in particular in the Indian Ocean, and initiation of operational near-real-time ocean modelling for the Atlantic Ocean. An International TOGA Scientific Conference is being planned for 16-20 July 1990 with joint sponsorship of WMO, ICSU and IOC.

The development of WOCE plans has continued, with the International WOCE Scientific Conference indicating that the required necessary resources are to a large extent available. However, there is, in light of recent developments, reason to express concern with respect to the availability of satellite remote sensing resources. The proposal for institutional arrangements for WOCE has been developed in accordance with the resolution adopted by the Executive Council at its Twenty-first Session in 1988.

The Tenth Session of CCCO was convened in Halifax (16-22 June 1989). Through CCCO, Unesco and IOC are supporting the Second World Climate Conference scheduled for the end of 1990. There is a need to ensure that the role of the ocean in climate control and change be adequately reflected at the Conference, as well as the implementation of the ocean component of WCRP, together with the necessity of gradually establishing adequate ocean observations for climate monitoring and prediction.

In the programmes on ocean resources, a strong implementation phase is progressing for ocean science in relation to living resources, with activities in many regions, including the Caribbean, Atlantic (North and South), Western Indian Ocean and East and West Pacific. The degree of advancement varies, but there are efforts under way in all the areas. These cover both the IREP (SARP and TRODERP) and Ocean Blooms and Red Tides, where IOC has supported recent workshops in Bangkok and Brunei and a symposium in Lund, in June. On the basis of these activities, a further programme formulation, using the Takamatsu report, is being planned for the fall of 1989.

The development of this programme illustrates very well the rule that in order to push a programme and implement it with continuity and strength, one necessary condition is the availability in the IOC Secretariat of a full-time staff member who is expert in the relevant fields and is experienced in international work. On behalf of the Commission I want to express gratitude to the Federal Republic of Germany for the support of a staff member to this programme.

The programme on Ocean Science in Relation to Non-living Resources is making steady but slow progress; in this case we do not have a full-time staff member, but are very grateful to France for making an expert available part-time (1/4 of full-time).

The Group of Experts on OSNLR met in February. In particular, I want to inform you about activities in West Africa - the IOCEA region - where a regional cruise to study aspects of the sedimentary regimes and budget in part of the region is being planned. Nigeria is putting a research vessel at our disposal free of charge, for which we are very grateful. Participants from the region have been identified and the costs associated with implementation are being covered by IOC. This regional initiative can serve as an important input to a larger regional project with extra-budgetary funding.

I would also like to inform you that at the recent regional meeting in Quito, Ecuador, organized by CPPS with the participation of IOC, it was agreed to form a joint Regional Study Group of Experts on OSNLR.

The ocean mapping programme is steadily progressing with able leadership provided from inside and outside the Secretariat. Several regional activities are well under way and new ones have been initiated in the Western Indian Ocean. Again, the support of the USSR in seconding a full-time staff member expert in the field for this programme is providing invaluable help.

This year preparations for major activities continued in the marine pollution research and monitoring programme - GIPME - and its MARPOLMON, including several regional workshops, as mentioned in the report. Preparations for the Open-Ocean Baseline Study in 1990 are also under way. This action is of considerable interest in relation to other IOC programmes.

Following the successful completion of the Second Workshop on Biological Effects Techniques in a Sub-Tropical Climate Regime, the GEEP is presently preparing a series of manuals, and working on the scientific basis for the identification of particularly sensitive sea areas.

Within the GIPME Programme, co-operation with other organizations, besides UNEP, includes IMO, IAEA, FAO, ICES, CPPS, ICSEM and the Mediterranean Action Plan. This co-operation is a sign of the on-going strengthening of the dialogue within this programme with the users of the results obtained from GIPME. In this programme the IOC is contributing considerably to the preparation of regional reviews on the state of the health of the ocean, in collaboration with FAO and UNEP, and on regional evaluations of potential impacts on coastal zones and areas from predicted changes of sea-level and temperature induced by expected climate changes, in co-operation with UNEP and regional bodies.

These are important examples of trying to use the results of scientific studies for practical purposes. On the other hand, within GIPME we are also maintaining a close liaison with global geoscience programmes such as JGOFS. This provides a necessary interfacing with a broad scientific community. Finally, I should mention that IOC is increasing its involvement with GESAMP, and that the most appropriate action may be for IOC to become a co-sponsor of GESAMP.

Since I took over as Secretary, there has been no head of the GIPME programme in the Secretariat, and from March until June, when a Danish Associate Expert and a consultant arrived,

there was no professional at all in this subject area. I want to express strong gratitude to Denmark for the support. The post of Senior Assistant Secretary for Marine Pollution Research and Monitoring has been transformed into that of Deputy Secretary IOC (D-1) covering, inter alia TEMA matters; and is up for recruitment. The present post of Senior Assistant Secretary for TEMA (P-5) will in due course be transformed into that of Senior Assistant Secretary for Marine Pollution Research and Monitoring and advertized. GIPME is a major programme of IOC, with extensive co-operation and related obligations, and it is absolutely essential to have a senior staff member in the Secretariat for this programme as soon as possible.

Ocean Services is the other large building block of the activities of the Commission. Very considerable efforts are being made in the IOC Secretariat, by Member States and by the co-operating partners, WMO in particular, in order to push ocean services development and implement the decisions made by the Governing Bodies concerned. It is in this area that the build-up of response and involvement of the community is strongly needed, both nationally and internationally, so as to make it possible to meet the future needs of ocean observations and supply of ocean data for sub-regional, regional and global purposes. It is to be noted that understanding and prediction of local events and changes require global data inputs and interpretations - think of "El Nino" and the Monsoon effects - and that no local or sub-regional database is sufficient to produce reliable impact assessments with a narrow uncertainty range. This fact is simply a result of ocean dynamics and the spectral distribution of its variance. Ocean observations of a monitoring character will also gradually become more and more essential for the proper use of the ocean resources.

In order to achieve the goal of having an established functioning ocean observing system, e.g. in the the form of a world ocean watch, a concerted action is needed on the part of Member States, including the ocean science and the ocean user communities. A harmonized approach is required on a solid scientific basis. It is very encouraging to experience the positive interest of the TOGA, WOCE, CCCO and JGOFS communities in providing scientific input to the establishment of an ocean observing system covering a wide range of parameters. It should be noted that the major responsibility for designing the system rests with the oceanographers; however, the implementation and support of the system will depend on governmental marine institutions. The meteorological community is certainly requiring certain observations on a monitoring type basis, related to weather and climate, and the participation of WMO in establishing that part of the system is very strong indeed. However, it is up to the ocean community to build up the whole system, and here, the IOC, as the only intergovernmental body with specific charge of the ocean, must play a strong leading role. Again, it is encouraging to note the support of important parts of the scientific community for IOC's role in this respect.

Major developments during the period include the formulation of the GLOSS Implementation Plan, before you as Annex 4 of the Action Paper; the training courses and First Session of the Group of Experts on GLOSS; and the great interest shown by many regions in the establishment of regional GLOSS components. The recommendation of the IOC-WMO Working Committee on IGOSS with respect to the sea-level project should also be noted.

The Fifth Session of the Joint IOC-WMO Working Committee for IGOSS in November 1988 made several recommendations of great interest to IOC. These include, in particular, the need for: (i) the establishment in accelerated phases of an enlarged ocean observing system; (ii) the joint undertaking of training with WMO on marine meteorological-oceanographic observations for applications; (iii) the establishment of a Joint WG on Satellite Remote Sensing Data for Operational Use; (iv) the need for more interface and co-ordination between IGOSS and IODE; and (v) the adoption by the Committee of the IGOSS Plan and Implementation Programme 1989-1995.

The subject of data transmission, exchange and availability, are clearly matters in need of consideration. The international co-operative and concerted action programmes may well form a framework for this. A similar approach to that used in the area of satellite data availability could perhaps be considered, namely that of participating in the internationally agreed co-operative research programmes. The same mechanism could be used in relation to the monitoring system.

The International Tsunami Warning System in the Pacific - ITSU - has recently made a good step forward by obtaining provisional grant support for an IOC two million dollar proposal to UNDP. A recent IOC-UNDP mission has laid the plans for implementation of the project. Several activities being organized in the fall of 1989 are well in hand.

The strengthening of national and regional research capabilities is facilitated and co-ordinated through the TEMA and the gradual implementation of the Comprehensive Plan for a Major Assistance Programme to Enhance Marine Science Capabilities in the Developing Countries. The approach includes regional training activities, to a large extent related to a regional component of an IOC subject area programme, like OSLR, OSNLR, GIPME, mapping, data exchange and management, or ocean dynamics. Courses are also presented at training centres, as for instance the course at the World Maritime University. In this way about 320 individuals have received instruction during the reporting period. These training courses are supported from the Regular Programme and the Trust Fund. Other mechanisms are the individual study grants and internships provided by IOC to scientists to facilitate their participation in activities relevant to IOC programmes, the shipboard training in support of WESTPAC activities, and the research fellowship scheme covering extended periods of individual training. All these activities are very important and much sought after, as is shown by the number of applications. It would be highly desirable if these mechanisms could be used more extensively through larger voluntary contributions to these activities by Member States.

Activities within the framework of the IOC Regional Subsidiary Bodies, covering seven regions, are central to the implementation of the IOC Programmes. The activities thus cover a wide range of subject areas, in accordance with the characteristics and priorities of the regions in question. The progressive development and realization of the need for marine science and related services vis-a-vis uses of the marine environment are evident, and are paralleled by an enhancement of the activities through regional co-operation and co-ordination. This mechanism quite clearly strengthens very considerably both the contribution which the marine science and services activities can provide to the countries involved, and the support to these activities from the countries. This is evidenced, for example, through the developments in WESTPAC, where the review of the activities and involvements over the last fifteen years (Document IOC/INF-773) clearly shows this. The intersessional activities in WESTPAC have also been very large, owing to a combination of factors, namely: (i) the follow-up to the Fourth Session of WESTPAC; (ii) the support from regional Governments, including the provision of personnel (from Australia and China); (iii) the actions of the officers of the Regional Committee; (iv) the finalization of Technical Assistance Projects; and (v) the co-operation with several other bodies in the region, e.g. CCOP, SOPAC, SPREP, and COBSEA. You will now find before you the proposal for the establishment of an IOC Sub-Commission for WESTPAC, and particulars are given in Document INF-773.

It is a pleasure to report that the IOC Secretariat for IOCARIBE is now well-established in Cartagena des Indias, Colombia, with the Agreement between Colombia and Unesco signed and with firm support from Colombia. On behalf of the Commission, I wish to express my appreciation and gratitude to the Government of Colombia. Considerable efforts have gone into the establishment of the Secretariat. The Secretariat also covers activities of IOC in the Southeast Pacific region, carried out in close co-operation with CPPS and UNEP. Support to the Secretariat from Sweden through an Associate Expert attached to the IOCARIBE Secretariat is also gratefully acknowledged, as is the support through IOC of a Swedish Associate Expert stationed at ROSTLAC in Montevideo, working for the IOC programme implementation.

It is a pleasure to be able to report a high level of activity in the Central and Eastern Atlantic Region (IOCEA). Several meetings have been convened there, in Nigeria, Republic of Cote d'Ivoire, Ghana, and Guinea, reviewing regional activities in the fields of marine pollution research and monitoring, OSLNR, and ocean services, and formulating further regional projects.

The levels of activity in the North and Central Western Indian Ocean and the Central Indian Ocean regions are gradually increasing through follow-up of the respective Regional Committee meetings in 1987 and 1988. The CCCO Indian Ocean Climate Studies Panel has stimulated interest in the climate research and observation activities, and several missions have identified participating laboratories and needs for selected projects. Most recently, a mission to Mauritius was implemented in early June 1989 which identified requirements and subject areas for a regional workshop on marine pollution research and monitoring.

The report from the First Session of the Regional Committee for the Central Indian Ocean (Islamabad, Pakistan, 3-7 July 1988) is before you for consideration under Agenda Item 7.1. Several follow-up activities have already been initiated in the fields of ocean dynamics and climate and ocean observations, marine pollution, coastal water dynamics and sea-level observations. A regional review on the state of the marine environment has been completed through co-operation with UNEP and a regional review on the potential impact on coastal zones and areas of predicted sea-level and temperature changes, possibly induced by expected climate changes, is under preparation through a joint IOC-UNEP regional ad hoc task team under the Chairmanship of Dr. Quraishee, who is also the Chairman of IOCINDIO. The excellent arrangements made for the First IOCINDIO Session and the associated preparatory meetings by the host country (Pakistan) institutions are most gratefully acknowledged.

The activities related to the Southern Ocean have focussed on strengthening ocean observations there, following the instructions of the Executive Council, through increased efforts on sea-level measurement, through the establishment in Australia of an IGOSS Specialized Oceanographic Centre for the Indian and South Pacific Oceans, including relevant parts of the Southern Ocean, through the development of drifting buoy plans in co-operation with the Drifting Buoy Co-operation Panel and the IOC-WMO Working Committee on IGOSS, and through the joint SCAR-WMO-IOC Scientific Meeting in Leningrad, February 1989. Considerable attention is also being given to these matters in the WOCE community, including the WOCE-SSG. A Regional Review on the State of the Marine Environment of the Southern Ocean has been completed as a joint IOC-UNEP effort.

I would also like to inform you that some limited extra resources have been forecast by Unesco for IOC activities in the Southern Ocean. In addition, it should be pointed out that SCAR, at its Twentieth Session, Hobart, Australia, September 1988, proposed to convene in 1991 a special conference on Antarctic Science to demonstrate the role of Antarctica in global processes in atmosphere, ocean and land. In view of the very important role of the Southern Ocean in this context, I would suggest that the Assembly consider the possibility of IOC co-sponsoring and providing support to that Conference.

The co-operation between IOC and the Permanent Commission for the South Pacific in the South East Pacific is solidly established, and concerns several subject areas within OSLR, OSNLR, GIPME, ocean dynamics and climate, and ocean observing systems (IGOSS).

Finally, I wish to draw your attention to developments in the Mediterranean. A proposal for co-operative studies in the western Mediterranean is before you to be considered under Agenda item 7.4. The final workshop on the first phase of the Programme on Physical Oceanography of the Eastern Mediterranean, June 1989, recommended that a second phase of POEM be initiated, including chemical and biological oceanography studies. The success of the first phase of POEM is very considerable, and it seems most appropriate that IOC be associated also with the second phase.

The co-operation between IOC and other organizations and programmes is widening and strengthening. The co-operation with WMO is particularly important and was referred to earlier. It should of course be realized that co-operation implies taking into account the partner's views and needs in joint programming and that this often implies the need for more time and effort on the part of the Secretariat in preparations and implementation, and presumes ample staffing in the Secretariat.

Collaboration with the ICSPRO Agencies is continuing and will be discussed under Agenda Item 8.1. It must be emphasized that the ICSPRO Agreement is unique and all efforts must be made to make the most constructive application of the Agreement. This is one aspect of the updating of LEPOR, the present text being before the Assembly in form of Annex 5 of the Action Paper, to be considered under Agenda Item 8.1.1. The document will also be considered by ECOSOC next week.

It should be noted that UNEP attended the 27th Session of ICSPRO, April 1989, and presented several suggestions for further co-operation between IOC and UNEP, on ocean monitoring for climate change and pollution contamination, on regional activities and on GIPME.

Several consultations have been held between SCOR Officers, Officers of the IOC and members of the Secretariats, during the JOA in August 1988, in November 1988, and in May 1989.

These clearly indicate a trend of increasing exchange and collaboration between IOC and SCOR. The unique role of the Joint SCOR-IOC Committee on Climatic Changes and the Ocean - CCCO - has also been considered and it seems clear that CCCO can play a very important part in continuing to ensure that the role of the oceans in climate and associated global changes is properly taken into account in the global analysis of such changes. In this context, I permit myself to draw the attention of Member States to the imperative requirement of informing national institutions of the fact that global long-term change and climate change cannot be elucidated and understood without proper study of the ocean and that adequate ocean observations are a must for a reliable prediction of such changes through mathematical-dynamical models. In the light of all this, it is gratifying to note that CCCO exists and that the support to the CCCO Secretariat from the United States is being maintained. This is gratefully acknowledged, as is the support from Australia.

I would also like to draw your attention to the report of the ad hoc meeting to consider the potential role and contribution of IOC to the ICSU-IGBP, a Study on Global Change, and its recommendation.

The IGBP is emerging. It will deal with the scientific aspects of major problems facing humankind - that of global change. That this constitutes a problem for human societies is, of course, known throughout our existence - but now we have through recent scientific and technological achievements the possibility of studying global change and perhaps making predictions thereof. The IOC, being the only intergovernmental body dealing specifically with ocean science and services, must share in the responsibility of providing inputs to these studies. This can be achieved through the existing IOC Programmes - as was clearly brought home by the ad hoc meeting and as is shown in the report.

In this context, allow me also to say that information exchange and dialogue between different international organizations through the Governing Bodies and Secretariats is becoming increasingly important, for many reasons. The demand for human and other resources is increasing to such an extent that avoidance of duplication of effort and co-ordination become absolute musts. Information on IOC activities must be actively provided to participants and representatives in the General Conference of Unesco, in the Governing Council of UNEP and in the UN General Assembly, to mention but a few. This information flow must be active, through a direct dialogue. Passive information flow through the provision of reports or brochures is not sufficient.

I should also draw your attention to the considerable intersessional work which has gone into the preparation of the Draft Unesco Third Medium-Term Plan 1990-95. At the end of the day, all we have to show for these efforts are three small paragraphs in the draft. However, these do include all basic elements mentioned in Resolution 7 of the Twenty-first Session of the IOC Executive Council. A more elaborate interpretation of the possible role of IOC is presented in Document XV/8 Annex 6, in which the Secretariat also attempts to present a medium-term strategy for implementation. The approach here is based on the possibilities of having implementation of the programme phased in time and in space i.e., in successive regional implementation. The rates of implementation are, of course, dependant upon the provision of resources : nationally, internationally, and to the IOC Secretariat. The initial considerations made by the ad hoc Study Group on Measures to Ensure Adequate and Dependable Resources for the Commission's Programme of Work are relevant in this context.

Allow me to finish by expressing my gratitude to my colleagues in the Secretariat for their good and untiring work and support. It is well known that the staffing of the Secretariat is fairly limited, so I do not have to dwell on that. It will suffice to refer to document IOC-XV/8 Annex 7 to be considered under Agenda Item 9. However, personally, I am grateful and honoured to be here because I believe in the work and the Organization - and the need for the IOC - which is hopefully evident to all of you. It is up to all of us to make this need also clear to other parts of society, and to encourage the use of the Organization. For us to achieve our tasks, a harmonized, co-operating community involving the scientific as well as the user communities is necessary. We should all work towards obtaining this.

You are the Organization and you should think occasionally not only of what good can the Organization do for your country but also what good can your country do for the Organization - so as to facilitate reaching our common goal of better knowledge of ocean space based on scientific understanding for the benefit of all.

Thank you.

ANNEX IV

MEMBER STATES OF THE COMMISSION AND ITS OFFICERS

A. List of Member States of the Commission (117)
(as at 20 July 1989)

* ALGERIA
ANGOLA
* ARGENTINA
* AUSTRALIA
AUSTRIA
(The) BAHAMAS
BANGLADESH
BARBADOS
BELGIUM
BENIN
* BRAZIL
* BULGARIA
CAMEROON
* CANADA
CAPE VERDE
* CHILE
* CHINA
* COLOMBIA
CONGO (The)
* COSTA RICA
* COTE D'IVOIRE
* CUBA
CYPRUS
DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA
DENMARK
DOMINICAN REPUBLIC (The)
ECUADOR
* EGYPT
ETHIOPIA
FIJI
* FINLAND
* FRANCE
GABON
GAMBIA
GERMAN DEMOCRATIC REPUBLIC (The)
* GERMANY, FEDERAL REPUBLIC OF
GHANA
GREECE
GUATEMALA
GUINEA
GUINEA-BISSAU
GUYANA
HAITI
ICELAND
* INDIA
INDONESIA
IRAN, ISLAMIC REPUBLIC OF
IRAQ
IRELAND
ISRAEL
* ITALY
JAMAICA
* JAPAN
JORDAN
* KENYA
KUWAIT
LEBANON
LIBYAN ARAB JAMAHIRIYA (The)
MADAGASCAR
* MALAYSIA
MALDIVES
MALTA
MAURITANIA
MAURITIUS
* MEXICO
MONACO
MOROCCO
MOZAMBIQUE
MYANMAR
NETHERLANDS (The)
NEW ZEALAND
NICARAGUA
* NIGERIA
* NORWAY
OMAN
* PAKISTAN
PANAMA
PERU
* PHILIPPINES (The)
POLAND
* PORTUGAL
QATAR
REPUBLIC OF KOREA (The)
ROMANIA
SAMOA
SAUDI ARABIA
SENEGAL
SEYCHELLES
SIERRA LEONE
SINGAPORE
SOLOMON ISLANDS
SOMALIA
SOUTH AFRICA (Suspended)
* SPAIN
SRI LANKA
SUDAN (The)
SURINAME
SWEDEN
SWITZERLAND
SYRIAN ARAB REPUBLIC (The)
* THAILAND
TOGA
TONGA
TRINIDAD AND TOBAGO
TUNISIA
TURKEY
* UKRAINIAN SOVIET SOCIALIST REPUBLIC
* UNION OF SOVIET SOCIALIST REPUBLICS
UNITED ARAB EMIRATES
* UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND
UNITED REPUBLIC OF TANZANIA
* UNITED STATES OF AMERICA
URUGUAY
* VENEZUELA
VIET-NAM
YEMEN
YUGOSLAVIA

MEMBERS OF THE EXECUTIVE COUNCIL ARE INDICATED WITH AN ASTERISK *

B. Officers of the Commission
(as at 20 July 1989)

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ANNEX V

ANTON BRUUN MEMORIAL LECTURES 1989
(Abstracts)

Tuesday, 4 July 1989

IMPACT OF NEW TECHNOLOGY ON MARINE SCIENTIFIC RESEARCH

(Chairman: Prof. M. Murillo, First Vice-Chairman IOC)

B. Grandvaux (France)	Submersibles and Remotely-Operated Vehicles at the Service of Oceanological Research
Anthony S. Laughton (UK)	The Shape of the Ocean Floor
D. James Baker (USA)	Observing Change in the Global Ocean: the View from Space

SUBMERSIBLES AND REMOTELY OPERATED VEHICLES AT THE SERVICE OF OCEANOLOGICAL RESEARCH

by
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One of the main aims of IFREMER, a public body, is to offer to the national scientific community the facilities of the heavy equipment which it requires for oceanographic research.

Within this framework, and based on more than 20 years experience, its teams have developed and operated a whole range of first-class submersibles, remotely-operated vehicles, equipment and tools for exploitation and intervention in deep seas.

This presentation is aimed at describing their main components and commenting on contributions made to discoveries and recent scientific oceanographic activities.

As can be seen, these vehicles were often used in international cruises in which some of the most well-known scientific teams participated.

THE SHAPE OF THE OCEAN FLOOR

by
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The shape of the ocean floor refers to features varying in size from sand ripples to ocean basins. The shapes of features tell scientists about their origin and about the processes in the ocean. Thus sand ripples indicate a high energy environment, deep sea channels indicate confined density flows, caldera on seamounts indicate volcanism and mid-ocean ridges, with their offsetting fracture zones, reveal the movement of tectonic plates.

But the shape of the seabed is also needed by engineers for laying cables and the construction of seabed installations, by seamen for navigation, by the navy for submarine operations and for acoustic characterization, by fishermen for locating upwelling nutrients, by mineral prospectors to locate and exploit seabed resources and by lawyers to determine the boundaries of national jurisdiction.

Different technologies are required to observe the features over a size spectrum of ten decades. At one end, direct observation from submersibles, underwater photography and television have long been used, supported by sampling and laboratory measurements.

At the other end, contoured charts of ocean basins or parts of them, derived from the compilation of soundings from many ships, have been used for more than a hundred years, although they have always been constrained by the relative paucity of data points. The global chart series, GEBCO, jointly sponsored by IOC and IHO has evolved during this century with increasingly detailed and accurate bathymetric charts and is now moving to the age of the electronic chart.

Until the last decade or two, bathymetric charts of the deep ocean, even when the surveys have had closely spaced lines and good navigation, have been limited in resolution of bottom features by the water depth and by the wide beam angle of echosounders.

Now it has become possible to examine features in the size range between those observed by visual or photographic means and those mapped by conventional surveys using multibeam swath echosounding techniques, long-range side-scan sonar, such as GLORIA, operating from near the surface, and near-bottom high-resolution sonar operated from deep-towed or autonomous vehicles. These techniques have revealed new processes at work in the ocean and have provided valuable new data for geologists and oceanographers.

The GLORIA system has enabled the huge new areas of the sea bottom, now being claimed as Exclusive Economic Zones by coastal states and which could amount to nearly forty percent of the area of the oceans, to be rapidly and cheaply surveyed in reconnaissance mode in order to pinpoint areas of economic interest for subsequent detailed examination.

The wealth of new high-resolution data from the new technology combined with the high accuracy navigation becoming available makes heavy demands on the processing and presentation of the results and their accessibility to the end user. Computer technology and geographical information systems will need to be exploited to the full.

OBSERVING CHANGE IN THE GLOBAL OCEAN: THE VIEW FROM SPACE

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To understand the ocean, we must observe it. To understand it on a global scale requires techniques that can provide a global view. Satellite-borne instrumentation, developed over the past decade, can yield unique and unifying data for such understanding. The career of Anton Bruun parallels the development of satellites and of the growing interest in global change and the role of the ocean. In the early 1900s when Bruun was born came the recognition of the importance of the growing concentration of carbon dioxide for global warming and the development of rocketry; by the 1950s when Bruun was active in international work the first satellite measurements were made.

In the 1930s global synoptic satellite measurements of the ocean were demonstrated. The ocean programmes of the 1970s also led to the realization that the ocean was a key element in global change. Better understanding of the space and time scales of eddies, mixing, and chemical, biological, and air-sea interaction processes, together with the new technology, both satellite and in-situ, led to the planning for

such programmes as the Tropical Ocean Global Atmosphere (TOGA) programme, the World Ocean Circulation Experiment (WOCE), the Joint Global Ocean Flux Study (JGOFS), and IOC's Coastal Dynamics programme. Together these programmes will form the basis for a new understanding of global change and of coastal environmental processes. All of these programmes have as central elements satellite measurements. The lecture will summarize how these new satellite-borne instruments work, where we stand today with measurement systems, and what the future holds. The lecture will conclude with a discussion about the role of satellite systems in a global operational ocean measurement network for both large-scale and regional studies.

ANNEX VI

EXTRACTS OF THE SUMMARY REPORT OF THE FIRST SESSION OF THE ad hoc STUDY GROUP ON MEASURES TO ENSURE ADEQUATE AND DEPENDABLE RESOURCES FOR THE COMMISSION'S PROGRAMME OF WORK

A - Modalities of Participation of Member States*

All Member States should contribute on an equitable basis to the IOC Programme and budget in accordance with the purposes of the Commission and its adopted programme of work. Support provided by Member States, whether through Unesco, the IOC Trust Fund, voluntary contributions or other means, must be properly documented so that the resources of the Commission during a given period are clearly identified in a timely manner.

Member State participation and their support to the IOC Programmes is directly linked to the benefits derived from active membership in the Commission, higher levels of participation resulting in increased benefits. Member State participation, whether intellectual or through direct or indirect funding, should be viewed as a major responsibility. This support can be identified within a broad spectrum of modalities, reflecting a diversity of abilities to undertake marine scientific research in partnership with other countries through concerted endeavours.

As a result of the development of the New Ocean Regime, many IOC Member States are in the process of consolidating their marine capabilities to participate in and fully benefit from the IOC programmes, and funds allocated for this purpose should continue to serve as seed money for TEMA-related activities. Such activities should also help to attract assistance aimed at strengthening national and regional efforts in marine science, ocean services and TEMA activities.

Although it considered that the task of identifying the spectrum of modalities for participation of Member States requires further consideration, the ad hoc Study Group identified the following modalities by which Member States can contribute to IOC activities:

(i) financial support to the IOC Programme of Work, through obligatory and voluntary contributions;

(ii) in-kind support pertinent to the IOC Programmes should also be provided by Member States to complement allocations made by the IOC. This modality includes hosting of scientific and technical meetings as well as total or partial support for travel and conference services;

(iii) attendance of national representatives and experts at scientific and technical meetings organized by IOC is essential to fulfill the objectives of the Commission; in all cases Members States should assume the cost of such participation;

(iv) the secondment of personnel and provision of associate experts to the IOC Secretariat by Member States has proven to be an effective way of strengthening the Commission's programme;

(v) the allocation of shiptime for the execution of the IOC Programme is also a valuable source of support from Member States;

(vi) the facilitation of the work of research vessels assigned to carry out activities of the Commission, to conduct mutually-agreed upon research projects is another important element of support provided by Member States to the IOC;

(vii) the provision made by Member States to incorporate in their bilateral arrangements activities relevant to the IOC;

* Document IOC/FUBIS-I/3, paras 55-59

(viii) the transfer of equipment to developing Member States through the IOC Voluntary Co-operation Programme (VCP) constitutes an essential and effective support to the IOC Programme;

(ix) generation and exchange of data and information constitutes a relevant venue through which Member States can effectively support the IOC programme of work;

(x) training of scientists and/or technicians supported by Member States through hosting and funding training courses,granting of Research Fellowships, and providing shipboard fellowships and travel grants is an important component of IOC activities;

(xi) it is vital that Member States improve considerably, and establish, if required, proper liaison mechanisms and adequate national coordination structures and counterpart arrangements in order to satisfy the needs of the interdisciplinary needs as well as the regional and global approaches of the IOC Programme and the promoting and coordinating role of the Commission.

B - Implications of Functional Autonomy*

Article 1 para 1 (a) of the IOC Statutes, as approved by the Twenty-fourth Session of the General Conference of Unesco, states that:

"the Commission is established as a body with functional autonomy within the United Nations Educational, Scientific and Cultural Organization".

This concept of functional autonomy of IOC, together with other relevant provisions of the IOC Statutes, determines the institutional relationship between Unesco and IOC.

The ad hoc Study Group, in responding to its tasks as assigned by the Twenty-first Session of the IOC Executive Council (Document IOC/EC-XXI/3, para. 299), and the Fourteenth Session of the IOC Assembly (Resolution XIV-20), examined the practical implications of the functional autonomy of IOC.

Thus, on the one hand, Unesco in accordance with the IOC Statutes (i.e. articles 4,9,10,12 and 13) has certain functions and powers with regard to IOC which could be identified as follows:

(i) Member States of Unesco or any organization of the United Nations system shall acquire membership of the Commission by notifying the Director-General of Unesco. Such membership will take effect from the date of receipt by the Director-General of such notification;

(ii) any Member of the Commission may withdraw from it by giving notice of its intention to do so to the Director-General of Unesco;

(iii) a Member of the Commission may be suspended from exercise of the rights and privileges entailed by membership of the Commission by decision of the General Conference of Unesco. Exercise of those right and privileges may be restored by decision of the General Conference;

(iv) the funds provided byUnesco to the Commission are appropriated and subject to decision by the General Conference of Unesco;

(v) voluntary contributions may be accepted and established as trust funds in accordance with the financial regulations of Unesco and administered by its Director-General;

(vi) the appointment of theSecretary of the Commission is made by the Director-General of Unesco, following consultation with the Executive Council of the Commission and the Executive Heads of the Organizations Members of ICSPRO.

* Document IOC/EC-XXI/3 paras 62-71

(vii) with due regard to the applicable Staff Regulations and Rules of Unesco, the Secretariat of the Commission shall consist of a Secretary and such other staff as may be necessary, provided by Unesco, as well as such personnel as may be provided, at their expense, by Members of the Commission, Member Organizations of ICSPRO, and other organizations of the United Nations system.

(viii) the Commission shall submit regular reports on its activities to the General Conference of Unesco;

(ix) the Statutes of the Commission and any amendments thereto shall be approved by the General Conference of Unesco, following a recommendation of, or after consultation with, the Commission; unless otherwise provided by the General Conference, an amendment to the Statutes shall enter into force on the date of its adoption by the General Conference.

On the other hand, in accordance with the IOC Statutes (i.e. articles 1,2,3,5,6,7,10 and 11) and well-established practice deriving therefrom, the Commission and its competent organs have several important functions and powers, entailing its discretion under the Statutes, resolutions or other instruments to carry out activities within its competence, such as:

(i) to exercise its functions provided for in article 2 of its Statutes;

(ii) to enter directly into any arrangements with Member States, intergovernmental or other bodies;

(iii) to conduct on its authority the activities provided for in its Statutes and other relevant instruments;

(iv) to include in its membership any Member State of any one of the organizations of the United Nations System;

(v) to ensure the management of its financial resources as made available through appropriations for this purpose by the General Conference of Unesco, provided through contributions by Member States of the Commission, or additional resources from other organizations of the United Nations system or other sources;

(vi) to arrange direct representation at intergovernmental or other meetings within or outside the United Nations system;

(vii) to act as a joint specialized mechanism of the organizations of the United Nations system that have agreed to use the Commission for discharging certain of their responsibilities in the fields of marine science and ocean services;

(viii) to maintain under review and ensure the periodic updating of the Long-term and Expanded Programme of Oceanic Exploration and Research (LEPOR) and report to ECOSOC and the UN General Assembly.

(ix) to make recommendations and provide technical guidance as to the formulation and execution of the marine science programmes of Unesco;

(x) to exercise certain functions in the field of marine scientific research and expertise as a competent international organization under the relevant provisions of the United Nations Convention on the Law of the Sea of 1982;

(xi) to decide upon the mechanism through which it may obtain scientific advice;

(xii) to take part as a distinct entity in any form of international co-operation in the field of marine science and its application;

(xiii) to elect its governing bodies and set up subsidiary bodies.

(xiv) to adopt its Rules of Procedure;

(xv) to perform any other functions provided for in the IOC Statutes or other relevant instruments.

Numerous documents of the Commission and particularly, Document IOC-XIV/8 and its Annex 4 and Resolution EC-XXI.7, as well as the *"Director-General's directives concerning the activities of the Secretariat in the field of oceanography and marine sciences"* transmitted to the Chairman IOC by the Director-General in his letter of 21 June 1988, provide pertinent evidence for the scope and further amplification of functional autonomy in order that the Commission adequately accomplishes its tasks and meets the expectations of its Member States.

The ad hoc Study Group considered that the Statutes and other relevant instruments themselves engender an assumed requirement of functional autonomy as indicated above which should be considered as an essential condition for the effective implementation of the Commission's tasks responding to the new requirements of the evolving marine scientific investigation.

It was also recognized that past and present practices of the Commission, largely applicable to the relationship of IOC to Unesco as its parent body and communication between the Secretariat and Member States, had resulted in a number of internal procedures that reinforce functional autonomy. **The ad hoc Study Group was of the view** that these practices should be placed on record and extended to include additional procedures that would facilitate the work of the Commission.

At the same time **the ad hoc Study Group considered** that in practice there were instances when the proper performance of functional autonomy was subject to certain unwarranted limitations and therefore, further improvement and clarification of its scope and implementation would enhance the role of IOC. In this connection it was pointed out that, while the Unesco Rules and Regulations, including those applicable to staff, did not cause any difficulties of principle, procedures governing internal management of the Commission's Programme and selection and recruitment of staff and consultants should be more in line with the concept of functional autonomy and its application. A particular case in point is the need to apply geographical distribution to oceanic regions rather than to the land-based areas used by Unesco.

To emphasize the importance that the Commission attaches to functional autonomy, **the ad hoc Study Group suggested** that the issues raised and the conclusions reached in this report be conveyed to the Director-General by the Chairman IOC. It is suggested that the Chairman and Vice-Chairmen may wish to take advantage of their usual consultation with the Director-General at the conclusion of the Assembly in order to bring to his attention these considerations and proposals. Should the Director-General so wish, his response to this consultation could take the form of a protocol or any other formal document containing the principles to be followed in the internal management of the Commission's programme and in improving the application of the concept of the functional autonomy of the Commission within Unesco.

ANNEX VII / ANNEXE VII / ANEXO VII / ПРИЛОЖЕНИЕ VII / المُلحق السابع / 附 件 VII

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Les noms et titres qui figurent dans les listes ci-après sont reproduits dans la forme où ils ont été communiqués au Secrétariat par les délégations intéressées. Les pays sont mentionnés dans l'ordre alphabétique anglais.

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政府间海洋学委员会
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ANNEX VIII

PROPOSED AMENDMENT TO THE IOC MANUAL: "SECTION 9. RESOLUTIONS"

The Technical Review Committee for Resolutions

A small Technical Review Committee for Resolutions should be established by the Executive Council for each session of the Governing Bodies, in order to carry out a careful textual review of each Draft Resolution before it is distributed in plenary.

Such Technical Review Committees, which should normally be chaired by one of the Vice-Chairmen of the Commission, should consist of no more than 8 other members, taking into account the requirement for continuity.

In selecting the membership of a Technical Review Committee, the Executive Council should take into account the fact that, as a general rule, initial work on each Draft Resolution has, for technical, timing and economic reasons, to be carried out on the English language text only. At the same time, at a later stage (after adoption of Resolutions in plenary) the Technical Review Committee will however have the added responsibility of ensuring that all four language versions of each adopted Resolution are identical in content.

A Technical Review Committee is responsible for determining whether Draft Resolutions placed before them are necessary and, if they consider this to be so, to ensure that the text of each Draft Resolution is clear and explicit. If the Technical Review Committee considers it necessary to propose changes to a Draft Resolution, it should ensure that these are strictly of an editorial or drafting nature so that the substance of the original draft is maintained. A Technical Review Committee has no responsibility for the substantive content of Resolutions. Should a substantive change be considered necessary for any reason, the Draft Resolution should be referred back to the originator(s), with an explanatory note.

ANNEX IX

LIST OF WORKING DOCUMENTS

Document Code	Title
IOC-XV/1	Agenda
IOC-XV/1 Add. rev.4	Revised Timetable
IOC-XV/2	Annotated Provisional Agenda
IOC-XV/3	Summary Report of the Fifteenth Session of the Assembly, published in the Unesco Main Series Documents as SC/MD/91 (this document)
IOC-XV/4	List of Documents
IOC-XV/5	List of Participants
IOC-XV/6	Report of the Secretary on Intersessional Activities
IOC-XV/6 Suppl.	List of Circular Letters, IOC Meetings, Meetings at which IOC was Represented, IOC Information Documents
IOC-XV/7	Status Report on the IOC Programme and Budget, 1988/89
IOC-XV/8	Action Paper
IOC-XV/8 Annex 1	Proposals on Further Development of Regional Components of GIPME/MARPOLMON and Co-operation with UNEP
IOC-XV/8 Annex 2	State of Planning of the Joint Global Ocean Flux Study (JGOFS) and Potential Participation of IOC
IOC-XV/8 Annex 3 + Add.	Proposal for Possible Association of the IOC with IGBP
IOC-XV/8 Annex 4	Proposed Implementation Plan for the Global Sea-Level Observing System
IOC-XV/8 Annex 5 + Add.	Marine Research and Ocean Services: Opportunities for Progress
IOC-XV/8 Annex 6	Draft Unesco Medium-Term Plan: IOC Contribution and Role
IOC-XV/8 Annex 7 + Add.	Proposal on the IOC Programme of Work and Budget for 1990-91
IOC-XV/8 Annex 8	Background Information and Requirements for the Establishment of a Regional Sub-Commission and Associated IOC Secretariat for the Western Pacific (WESTPAC)
IOC-XV/8 Annex 9	Granting of Observer Status to the Baltic Marine Environment Protection Commission - Helsinki Commission
IOC-XV/8 Addendum 1	Ocean Dynamics and Circulation on the Continental Shelf
IOC-XV/9 + Corr.	Draft Biennial Report of the IOC on Its Activities

N.B. This list is for reference only. No stocks of these documents are maintained

ANNEX X

LIST OF ACRONYMS

ASFA	Aquatic Sciences and Fisheries Abstracts (FAO-IOC-UN)
ASFIS	Aquatic Sciences and Fisheries Information System (FAO-IOC-UN)
CCCO	Joint SCOR-IOC Committee on Climatic Changes and the Ocean
CCOP	Committee for the Co-ordination of Joint Prospecting for Mineral Resources in Asian Offshore Areas
CCOP(SOPAC)	Committee for the Co-ordination of Joint Prospecting for Mineral Resources in South Pacific Offshore Areas
CD - ROM	Compact Disk with a Read-only Memory
CGOM	Consultative Group on Ocean Mapping (IOC)
CIDA	Canadian International Development Agency
CLS/Service Argos	Collecte-Localisation-Satellite
CMM	Commission for Marine Meteorology (WMO)
COARE	Coupled Ocean Atmosphere Response Experiment (TOGA-COARE)
CPPS	Permanent Commission for the South Pacific
DBCP	Drifting Buoy Co-operation Panel
ECOSOC	Economic and Social Council (UN)
EEZ	Exclusive Economic Zone
ECMWF	European Centre for Medium Range Weather Forecasts
ENSO	El Niño Southern Oscillation
ERFEN	Estudio Regional del Fenómeno 'El Niño'
ESCAP	Economic and Social Commission for Asia and the Pacific
FAO	Food and Agricultural Organization of the United Nations
GAPA	International Geological/Geophysical Atlases of the Atlantic and Pacific Oceans (CGOM)
GEBCO	General Bathymetric Chart of the Oceans (IOC-IHO)
GEEP	Group of Experts on Effects of Pollutants (IOC-IMO-UNEP)
GEMS	Global Environment Monitoring System (UNEP)

GEMSI	Group of Experts on Methods, Standards and Intercalibration (IOC-UNEP)
GESAMP	Group of Experts on the Scientific Aspects of Marine Pollution (IMO-FAO-Unesco-WMO-WHO-IAEA-UN-UNEP)
GESREM	Group of Experts on Standards and Reference Material (IOC-IAEA-UNEP)
GEWEX	Global Energy and Water Cycle Experiment (WCRP)
GF-3	IOC General Format No. 3 (International Oceanographic Data Exchange)
GFCM	General Fisheries Council for the Mediterranean
GGE	Guiding Group of Experts
GIPME	Global Investigation of Pollution in the Marine Environment (IOC)
GLOBEC	Global Ocean Ecosystems Dynamics
GLOSS	Global Sea-Level Observing System (IOC)
GTS	Global Telecommunication System (WWW)
IAEA	International Atomic Energy Agency
IAMSLIC	International Association of Marine Science Libraries and Information Centres
IBCEA	International Bathymetric Chart of the Central Eastern Atlantic (CGOM)
IBCCA	International Bathymetric Chart of the Caribbean Sea and Part of the Pacific off Central America (CGOM)
IBCM	International Bathymetric Chart of the Mediterranean and Overlay Sheets (CGOM)
IBCWIO	International Bathymetric Chart of the Western Indian Ocean (CGOM)
ICES	International Council for the Exploration of the Sea
ICSEM	International Commission for the Scientific Exploration of the Mediterranean Sea
ICSPRO	Inter-secretariat Committee on Scientific Programmes Relating to Oceanography
ICSU	International Council of Scientific Unions
IDOE	International Decade of Ocean Exploration (IOC)
IGBP	International Geosphere-Biosphere Programme (ICSU)
IGCP	International Geological Correlation Programme (Unesco-IUGS)
IGOSS	Integrated Global Ocean Services System (IOC-WMO)

IHB	International Hydrographic Bureau
IHO	International Hydrographic Organization
ILMR	International Laboratory of Marine Radioactivity (IAEA)
IMO	International Maritime Organization
IOCARIBE	IOC Sub-Commission for the Caribbean and Adjacent Regions
IOCEA	IOC Regional Committee for the Central Eastern Atlantic
IOCINCWIO	IOC Regional Committee for the Co-operative Investigations in the North and Central Western Indian Ocean
IOCINDIO	IOC Regional Committee for the Central Indian Ocean
IODE	International Oceanographic Data and Information Exchange (IOC)
IOI	International Ocean Institute
IOS	Institute of Oceanographic Sciences (UK)
IPCC	Intergovernmental Panel on Climate Change (UNEP-WMO)
IREP	International Recruitment Programme (OSLR)
ISLPP	IGOSS Sea-Level Pilot Project (IOC-WMO)
ISLPP-NTA	IGOSS Sea-Level Pilot Project in the North and Tropical Atlantic (IOC-WMO)
IUGS	International Union of Geological Sciences
JECSS	Japan and East China Seas Study
JGOFS	Joint Global Ocean Flux Study (SCOR-IOC)
JODC	Japan Oceanographic Data Centre
JSC	Joint Scientific Committee
LEPOR	Long-term and Expanded Programme of Oceanic Exploration and Research
MAB	Man and the Biosphere Programme
MAP	Margins of Active Plates (OSNLR)
MARPOLMON	Marine Pollution Monitoring System (IOC)
MEDI	Marine Environmental Data Information Referral System (IOC)
MEDS	Marine Environmental Data Service (Canada)
MIM	Marine Information Management (IODE)
MONEG	Monsoon Numerical Experimentation Group

NOAA	US National Oceanographic and Atmospheric Administration
NODC	National Oceanographic Data Centre (IODE)
NOP	National Oceanographic Programme (IODE)
NSCAT	NASA Advanced Scatterometer
OALOS	Office for Ocean Affairs and the Law of the Sea (UN)
ODAS	Ocean Data Acquisition Systems
ODC	Ocean Dynamics and Climate
ODP	Ocean Drilling Programme
OOSDP	Ocean Observing System Development Programme (CCCO)
OPC	Ocean Processes and Climate (IOC)
OSLR	Ocean Science in Relation to Living Resources (IOC-FAO)
OSNLR	Ocean Science in Relation to Non-living Resources (IOC-UN(OALOS))
PSA	Pacific Science Association
RECOSCIX-WIO	Regional Co-operation for Scientific Information Exchange - Western Indian Ocean
RNODC	Responsible National Oceanographic Data Centre (IODE)
ROSCOP	Report on Observations/Samples collected by Oceanographic Programmes (IOC)
RV	Research Vessel
SARP	Sardine-Anchovy Recruitment Project (IREP)
SCAR	Scientific Committee on Antarctic Research (ICSU)
SCOR	Scientific Committee on Oceanic Research (ICSU)
SEATAR	Joint CCOP-IOC Working Group on post-IDOE Studies of East Asian Tectonics and Resources
SOC	Specialized Oceanographic Centre (IGOSS)
SPAN	Space Physics Analysis Network
SSG	Scientific Study Group
STAR	Joint CCOP(SOPAC)-IOC Working Group on South Pacific Tectonics and Resources
TEMA	Training, Education and Mutual Assistance in the Marine Sciences (IOC)
TOGA	Tropical Oceans and Global Atmosphere (WCRP)
TOPEX/POSEIDON	Ocean Topography Experiment

TRODERP	Tropical Demersal Recruitment Project (IREP)
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
VCP	Voluntary Co-operation Programme (WMO)
WCRP	World Climate Research Programme (WCP)
WCP	World Climate Programme (WMO)
WDC	World Data Centre
WESTPAC	IOC Regional Committee for the Western Pacific
WMO	World Meteorological Organization
WOCE	World Ocean Circulation Experiment (WCRP)
WWW	World Weather Watch
XBT	Expendable bathythermograph